882-GPRS-XXX, 882-EDGE-XXX, & 882-HSPA-XXX

GSM Cellular Data Modem & IP Router

User Manual
001-0003-832
Revision 3; September 2009

February 2008	Released
July 2008	Rev 2 updates include Firewall functionality, new screen formats.
September 2009	Rev 3 updates include Black case with new power supply connector, Internal/External Serial ports, new screen format configuration file save & upload, and other functionality revisions. Removed 882-HSDP unit references.

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SECTION 1 – PREFACE

Copyright Notice

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This manual covers the operation of the CalAmp 882-GPRS, 882-EDGE, and 882-HSPA Cellular Data Modem IP Routers. Specifications described are typical only and are subject to normal manufacturing and service tolerances.

CalAmp reserves the right to modify the equipment, its specification or this manual without prior notice, in the interest of improving performance, reliability, or servicing. At the time of publication all data is correct for the operation of the equipment at the voltage and/or temperature referred to. Performance data indicates typical values related to the particular product.

No part of this documentation or information supplied may be divulged to any third party without the express written consent of CalAmp.

Products offered may contain software which is proprietary to CalAmp. The offer or supply of these products and services does not include or infer any transfer of ownership.

Modem Use

The 882 GSM Series modems are designed and intended for use in fixed and mobile applications. "Fixed" assumes the device is physically secured at one location and not easily moved to another location. Please keep the cellular antenna of the 882 GSM Series modem at a safe distance from your head and body while the modem is in use (see below).

Important

Maintain a distance of at least 20 cm (8 inches) between the transmitter's antenna and any person while in use. This modem is designed for use in applications that observe the 20 cm separation distance.

Interference Issues

Avoid possible radio frequency (RF) interference by following these guidelines:

- The use of cellular telephones or devices in aircraft is illegal. Use in aircraft may endanger operation and disrupt the cellular network. Failure to observe this restriction may result in suspension or denial of cellular services to the offender, legal action or both.
- Do not operate in the vicinity of gasoline or diesel-fuel pumps unless use has been approved and authorized.
- Do not operate in locations where medical equipment that the device could interfere with may be in use.
- Do not operate in fuel depots, chemical plants, or blasting areas unless use has been approved and authorized.
- Use care if operating in the vicinity of protected personal medical devices, i.e., hearing aids and pacemakers.
- Operation in the presence of other electronic equipment may cause interference if equipment is incorrectly protected. Follow recommendations for installation from equipment manufacturers.

Mobile Application Safety

- Do not change parameters or perform other maintenance of the 882 GSM Series modem while driving.
- Road safety is crucial. Observe National Regulations for cellular telephones and devices in vehicles.
- Avoid potential interference with vehicle electronics by correctly installing the 882 GSM Series modem. CalAmp recommends installation by a professional.

SECTION 2 – PRODUCT OVERVIEW

Module Identification

Label Information

The label contains the CalAmp part number, serial number, FCC ID and the IMEI numbers. The IMEI number is used by the GSM network to identify valid devices. The IMEI is only used to identify the device, and has no permanent or semi-permanent relation to the subscriber.

IMEI Dec: The International Mobile Equipment Identity number of the cellular module in decimal format.

General Description

The 882 GSM Series Cellular Data Modem & IP Router from CalAmp is the ideal solution for a wide range of cellular data network serial and Ethernet connectivity requirements.

The 882-GPRS modem features GSM GPRS speeds. The 882-EDGE modem features GSM GPRS and EDGE speeds. The 882-HSPA modem features GSM GPRS, EDGE, HSUPA & HSDPA speeds. The 882-EDGE and 882-HSPA will automatically be backward compatible to the level of service available from the carrier. The 882 GSM Series modems all support packet data services.

Features and Benefits

- EDGE and GPRS Dynamic or Static IP – Carrier Dependent
- Tri-Band UMTS/HSUPA (850/1900/2100) and Quad-Band GSM/GPRS network support
- Data rates up to 7.2 Mbps downlink and 2.0 Mbps uplink for HSPA
- Inbound and Outbound Ethernet Routing
- Embedded Linux on ARM 9 processor
- Internet access and web browsing via Ethernet connector
- VPN support
- DHCP Server and Inbound port mapping/translation (Port Forwarding)
- Modem Domain Names with Dynamic DNS
- Inbound IP termination with Static IP
- TCP/IP Packet assembler and dis-assembler for serial connected devices
- Local or remote configuration using HTML web server
- On-board SIM socket (1.8/3V)
- Diversity antenna port/auxiliary port for increased receive sensitivity
- Firewall configuration for increased network security
- USB Host Controller

Catalog Part Number Breakdown

882-GPRS-GEN, 882-EDGE-GEN, & 882-HSPA-XXX
(XXX = Carrier Identifier)

GEN = Generic
INT = International

External Connections

Front panel connections

Fig. 2.1 882-GPRS/EDGE & 882-HSPA Front Panel

Panel Indicator	Connection	Description
SVC TYPE	Service Type	Solid = Higher speed service Blinking = Lower speed service Off = No service
TX/RX	Transmit/Receive	Indication of data transmission or reception activity
DCD	Data Carrier Detect	Indicates modem's connection on the cellular network
RSSI	Receive Signal Strength Indicator	Solid = strong Blinking = medium Off = poor or none
Serial	RS-232	Serial to IP conversion use
RF (SMA)	Antenna	Main RF antenna input
AUX (SMA)	Diversity or GPS Antenna	Connector for Diversity or Cellular/GPS combination antenna (882-HSPA only)

Back panel connections

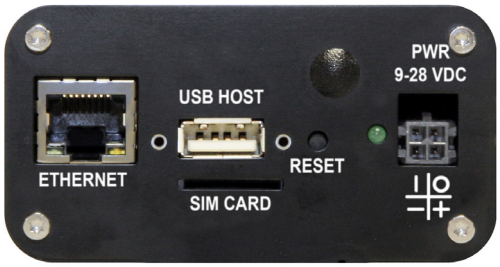


Fig. 2.2 882-GPRS/EDGE and 882-HSPA Back Panel

Panel Indicator	**Connection**	**Description**
ETHERNET	RJ-45 Ethernet	Interface for Ethernet connection to devices
USB HOST	USB	Interface for external devices (i.e., memory drives or GPS devices). ODP use only.
RESET		One second hold for unit reset. **If held for at least 4 sec, will reconfigure unit to factory default settings.**
PWR LED		Power indicator
PWR Jack	Molex 43025-0400 Power – bottom pins I/O – top pins	Interface for power plug (9-28VDC) Interface for Input and Output control lines ODP use only.
SIM CARD	SIM Card socket	Interface for carrier provided SIM card to activate connection with network provider

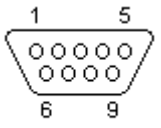
RS-232 Serial Port Integration Parameters

Table 2.1 provides the serial cable design information to integrate the 882 GSM Series modem into your system.

Table 2.1 Standard RS-232 DE-9 Pin out

Pin	Name	Direction	Description
1	CD	«—	Carrier Detect
2	RX	«—	Receive Data
3	TX	—»	Transmit Data
4	DTR	—»	Data Terminal Ready
5	GND		System Ground
6	DSR	«—	Data Set Ready
7	RTS	—»	Request to Send
8	CTS	«—	Clear to Send
9	RI	«—	Ring Indicator

Note: Direction is DTE relative DCE.



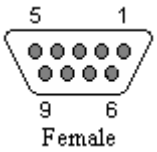


Table 2.2 Default RS-232 Communication Parameters

Bits Per Second	115,200
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None

Accessories & Options

Accessory/Option	Order Number	Description
	401-7500-001	4” Rubber Duck Antenna
	L2-ANT0003	3” Mag Mount Antenna
	150-7001-001	110 VAC Input Power
	150-7500-002	DC Power Cable
	L2-CAB0002	DB-9 Serial Cable
	L2-CAB0006	Ethernet cable

Primary Antenna

The primary antenna connection on the 882 GSM Series modems are female connectors, therefore you must purchase an antenna with an SMA male connector. Do not select an SMA antenna with “reverse polarity” or RP-Male. When using a direct mount or “rubber duck” antenna, choose the antenna specific to your band requirements. Mounting options and cable lengths are user’s choice and application specific. The AUX antenna connector is installed standard on the 882-HSPA modem and can be used for Diversity or True GPS.

The diversity port on the device supports three bands, Cellular (850MHZ), PCS(1900MHZ), and GPS(1575MHZ). Connect a dual band cellular antenna to this port to implement RX diversity on the unit and increase receive sensitivity on the cellular network. Connect a GPS antenna, with an average gain >-5dBi, if using the GPS functionality. If both RX diversity and GPS are required, install a Cellular/GPS combo antenna.

GSM Communications

Only GSM models have SIM cards. Your wireless service provider will supply the SIM card with your wireless service contract.

The 882-GPRS supports GPRS data.
The 882-EDGE supports EDGE and GPRS data.
The 882-HSPA supports HSUPA, HSDPA, EDGE and GPRS data.

SECTION 3 – GETTING STARTED

The 882 GSM Series modems can be configured via HTML web pages or AT commands on the serial port. You will need a GSM Cellular account and a carrier provided SIM card. For TCP/IP please request a GSM account with Mobile IP and optionally Static IP or Simple IP (SIP). This is carrier dependent.

The modem is configured with default settings and is ready to be configured via HTML. You may need to activate the modem with your carrier to start using it. The default settings are programmed for most operations.

Package Contents

- 882-GPRS, 882-EDGE, or 882-HSPA cellular data modem
- 150-7500-002 Power Cable
- Information Card

Local PC Ethernet Configuration

The 882 GSM Series modem is configured via the Internet which automatically allows your computer to obtain the proper IP address. For Windows XP users, select Start -> Control Panel -> Network Connections. Right click "Local Area Connection" and select "Properties" to open the configuration dialog box for Local Area Connection. See Figure 3.1.

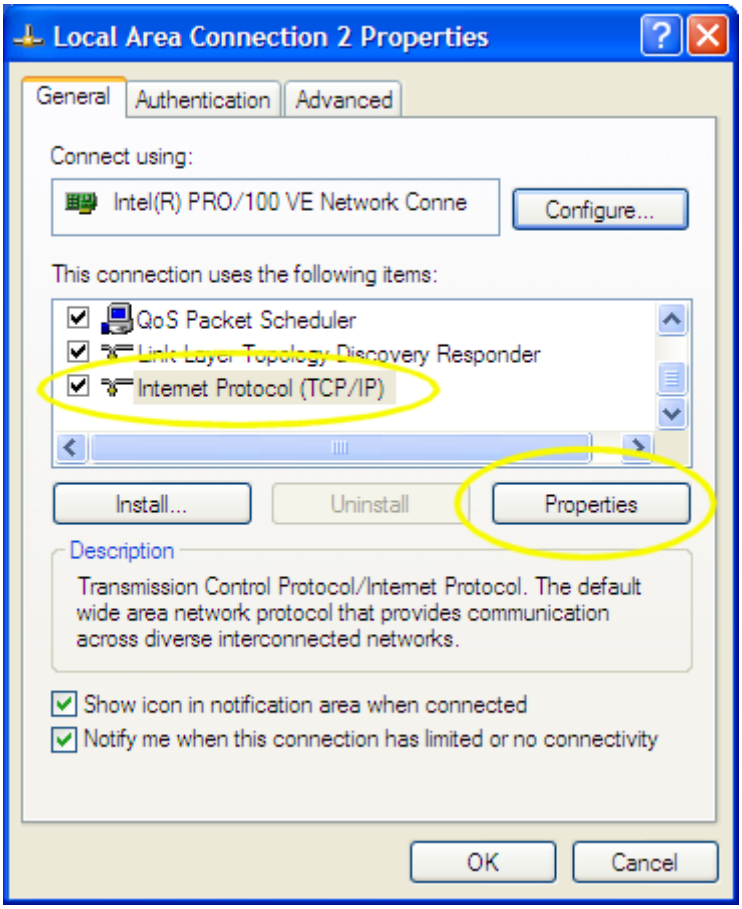


Figure 3.1: Local PC Network Connections Screen

Find and select "*Internet Protocol (TCP/IP)*" from the list box and then click the "*Properties*" button (Figure 3.1). The TCP/IP configuration window will pop up, refer to Figure 3.2. Under the General tab, select radio button "*Obtain an IP address automatically*" and "*Obtain DNS server address automatically*" (Figure 3.2). Click the OK button to close TCP/IP configuration window. Click the Close button to complete the computer preparation for the 882 GSM Series modem.

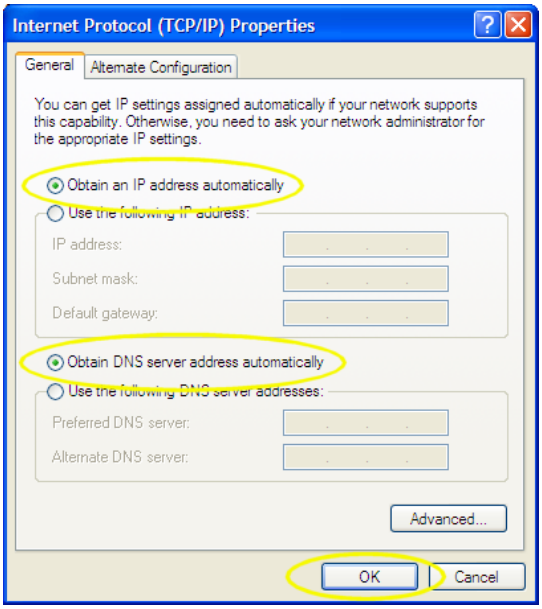

Internet Protocol (TCP/IP) Properties
General
Alternate Configuration
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

Figure 3.2: Internet Protocol (TCP/IP) Properties Screen

Connect an antenna to the RF connector on the front panel of the 882-GPRS, 882-EDGE, or 882-HSPA modem. Connect the Ethernet cross-over cable into the modem's Ethernet Port and plug the other end into the network port of your PC. Connect the Power Adapter to the modem and plug into a proper AC power socket. The Power LED on the panel should activate. The Service LED (SVC TYPE) and RSSI LED will light green to indicate the modem has finished starting up and is functioning.

Accessing the Modem's Homepage

Start your web browser and enter **192.168.1.50** in the address bar. A login screen should appear, enter the User Name: **admin** and the Password: **password** and click OK. Refer to Figure 3.3.

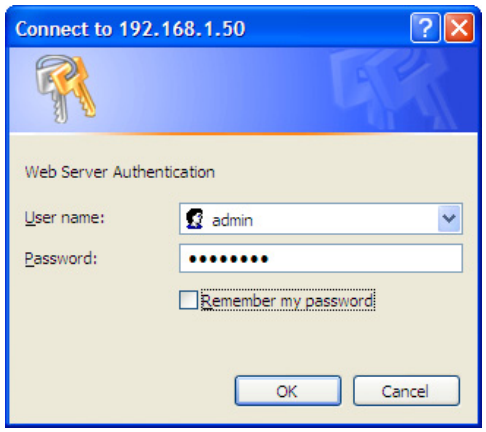


Figure 3.3: 882 GSM Series Browser Connection Login Screen

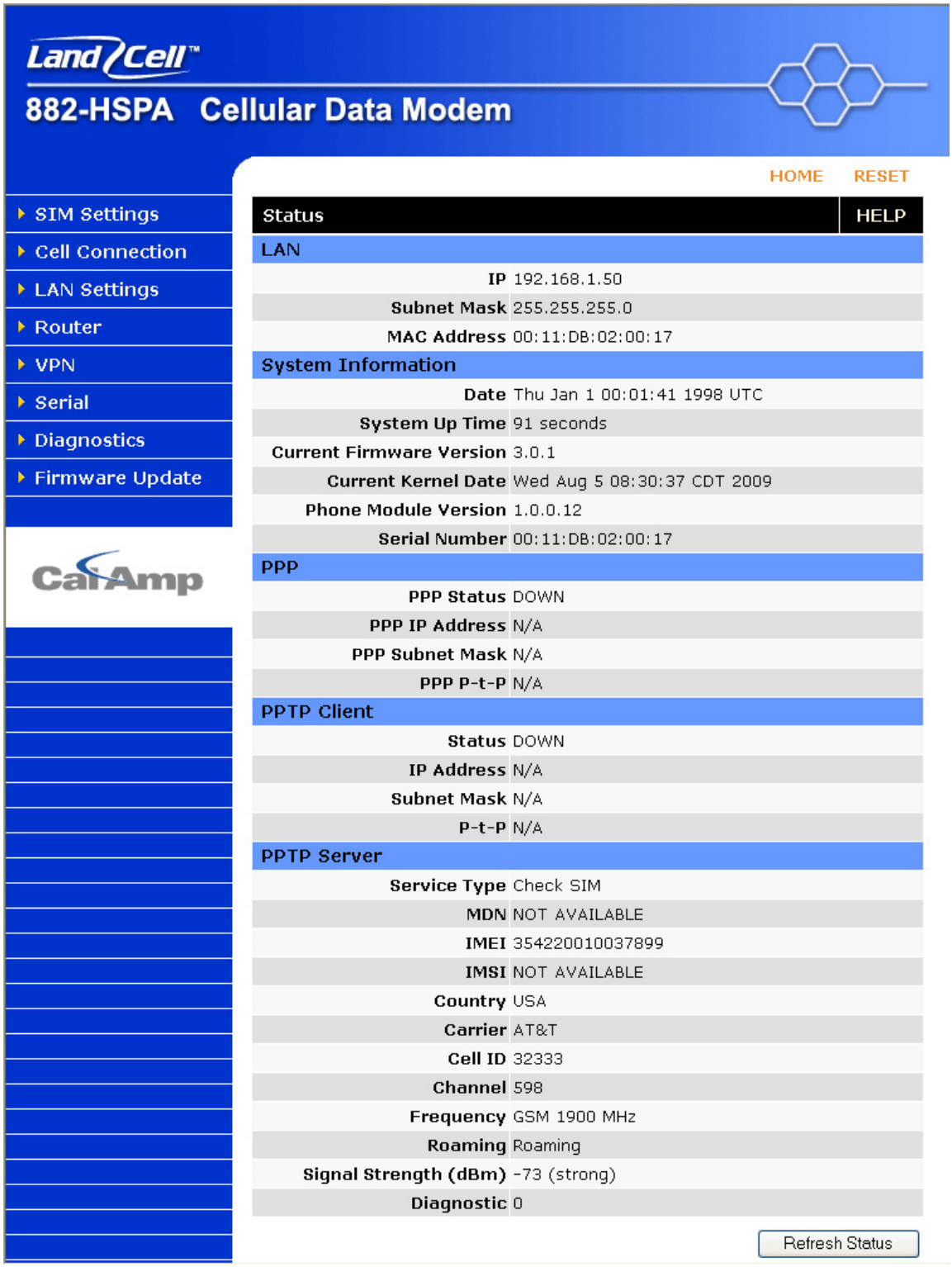


Figure 3.4: 882-HSPA Configuration Home Page (without SIM card)

Web screens are similar for all modems; the top header will display the unit's model number. The PPP status on the Home page will show **DOWN** because the new device is not enabled. The Service Type will show **Check SIM** if the SIM is invalid, missing, or if the PIN needs to be entered. Also, the MDN and IMSI lines show **NOT AVALABLE**.

Inserting the SIM Card

Power down the unit and insert the SIM card with the gold side up as shown in Figure 3.5. Push the card completely into the slot until it clicks in place.

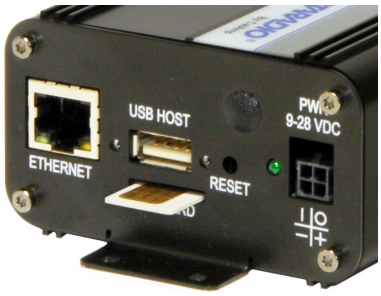


Figure 3.5: SIM Insertion

Power up the modem and return to the Home page to confirm the modem recognized the SIM card. The MDN may show the phone number and the IMSI and carrier information should display. Also, the PPP connection may not show as up until the SIM card is unlocked. Refer to Figure 3.7.

Select **SIM Settings** from the left side menu bar (Figures 3.6 & 3.7) to go to the SIM settings page.

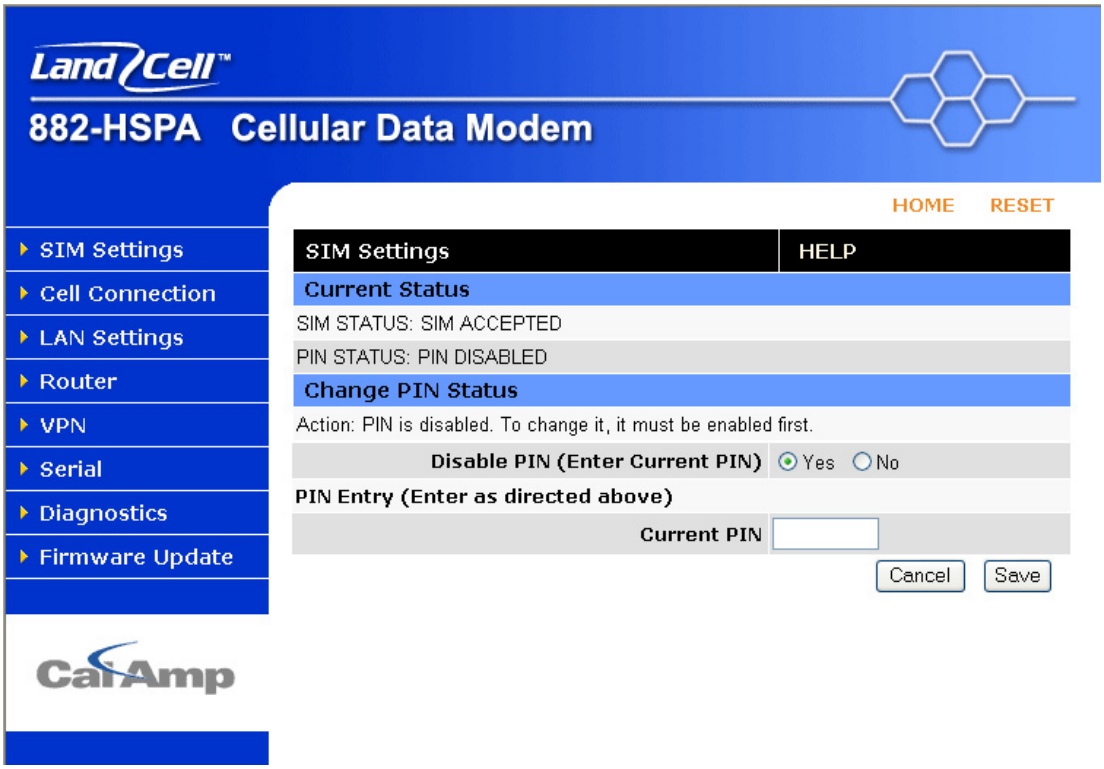


Figure 3.6: SIM Page (with SIM accepted)

The SIM STATUS should show the card is **ACCEPTED**. The PIN STATUS may show the PIN to be **DISABLED** or **ACCEPTED**. Refer to **Section 4** for information on changing the PIN and PIN status.

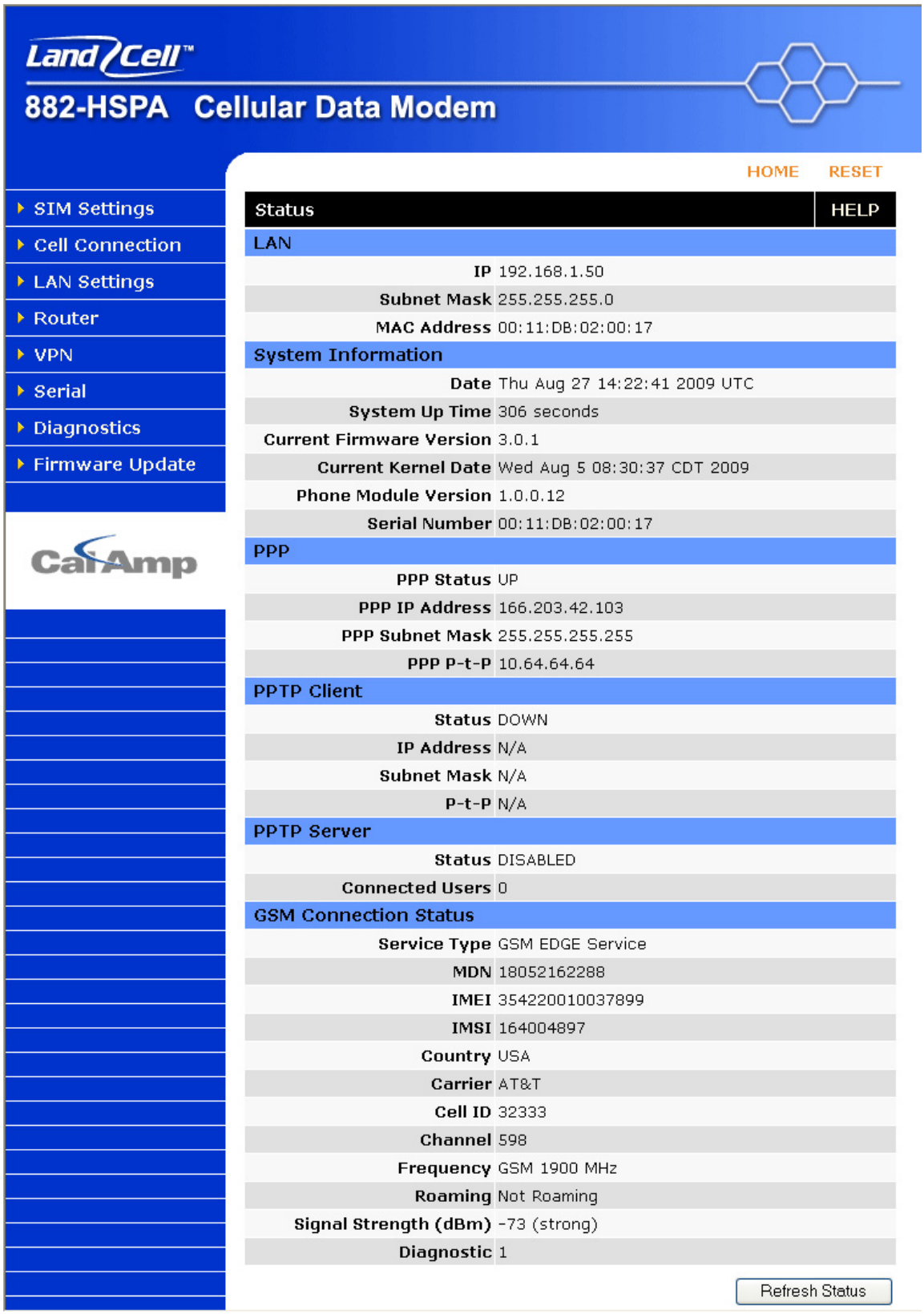


Figure 3.7: 882-HSPA Home Page (with SIM card, PPP connected)

SECTION 4 – SIM CARD PIN SECURITY SETTINGS

One of the key features of GSM is the Subscriber Identity Module (SIM), commonly known as a SIM card. The SIM is a detachable smart card containing the user's subscription information. This allows the user to retain information after switching modems. The SIM has a security feature which, when enabled, will require the user to enter a valid PIN before the modem will connect to the cellular network. Selecting **SIM Settings** from the left menu bar brings up the SIM Settings page. When a new modem is powered up with an active SIM card, the PIN status may initially be disabled as shown in Figure 4.1.

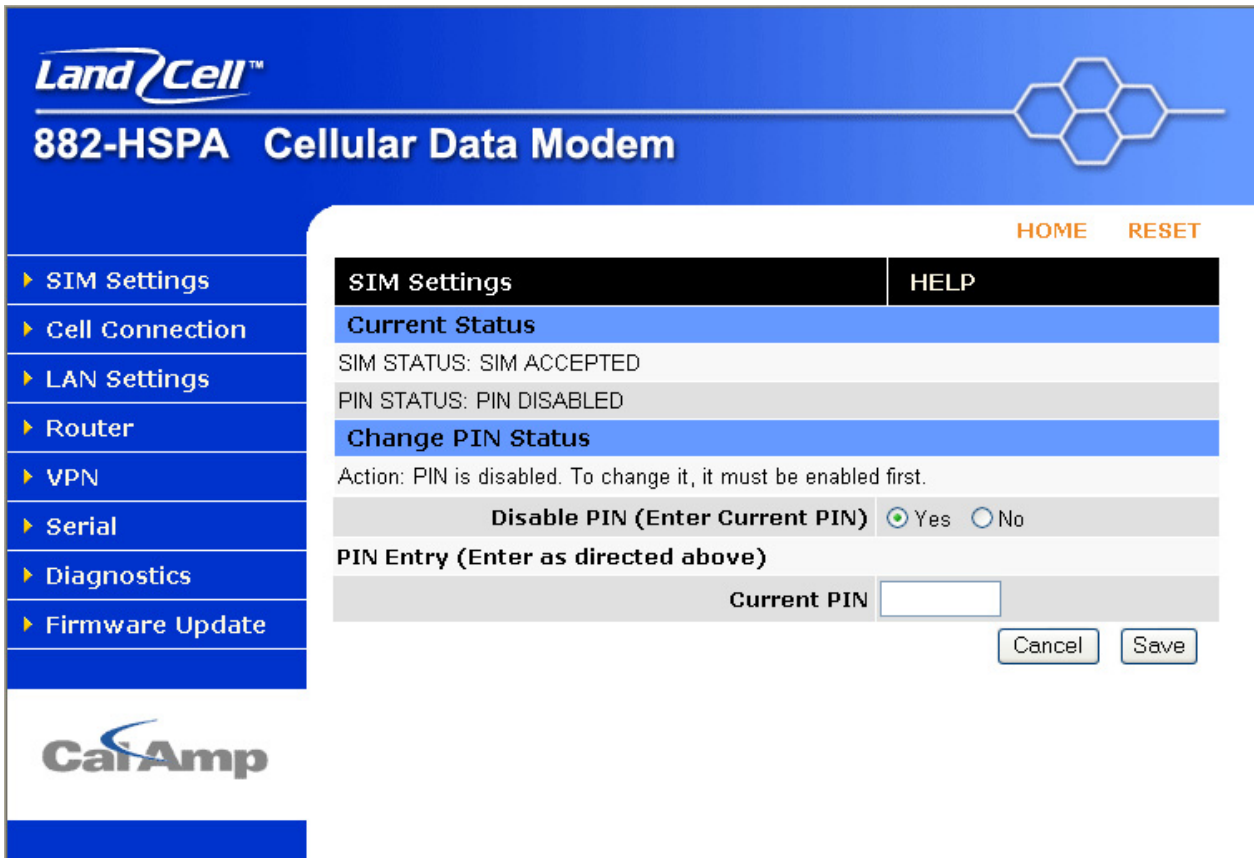


Figure 4.1: SIM Settings page, SIM accepted, PIN disabled

Enabling PIN Security

The PIN can be enabled from the SIM page by selecting **NO** for Disable PIN, entering the current PIN in the field provided, then clicking the **SAVE** button. The SIM setting's page will appear as shown below in Figure 4.2.

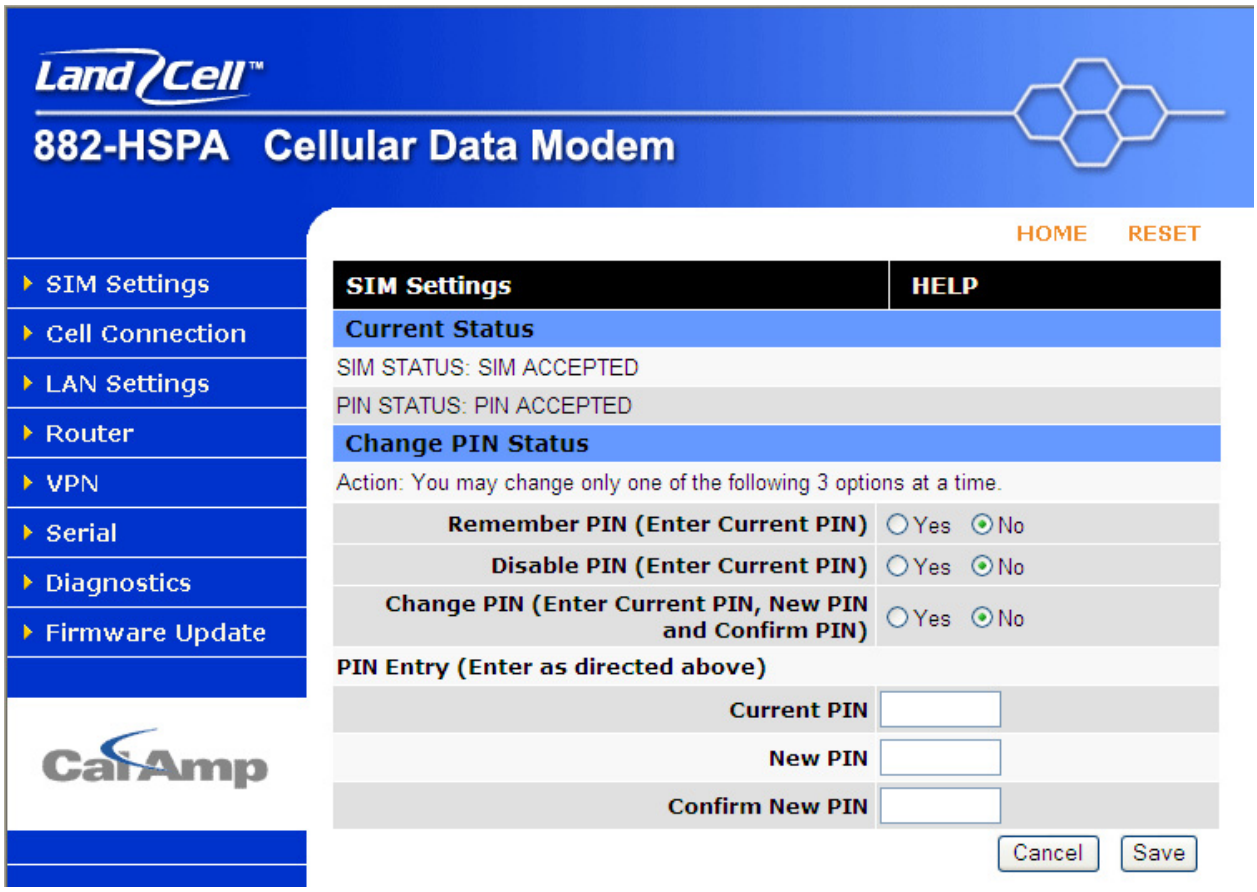


Figure 4.2: PIN Security Enabled

The PIN security feature is now enabled. The PIN STATUS shows that the PIN has been **ACCEPTED**. Now, when the modem is power cycled, the proper PIN will need to be entered in order for the modem to dial out. The PIN is entered from the SIM page as shown in Figure 4.3. The PIN STATUS displays **PIN REQUIRED, Enter PIN 3 attempts left**.

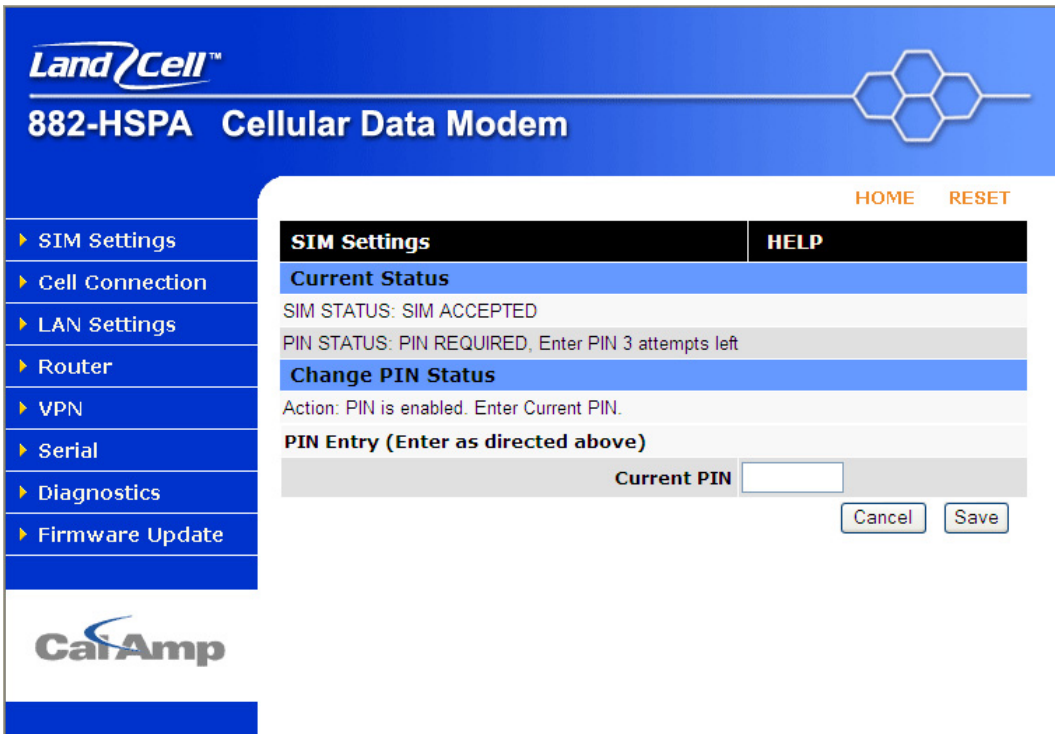


Figure 4.3: SIM settings for PIN Required

At this point the user has 3 attempts to enter the correct PIN. If the correct PIN is not entered after 3 attempts, an unlock code or PIN Unblocking Key (PUK) from the service provider will be required before the SIM card is usable again. Figure 4.4 shows the SIM settings after an incorrect PIN has been entered.

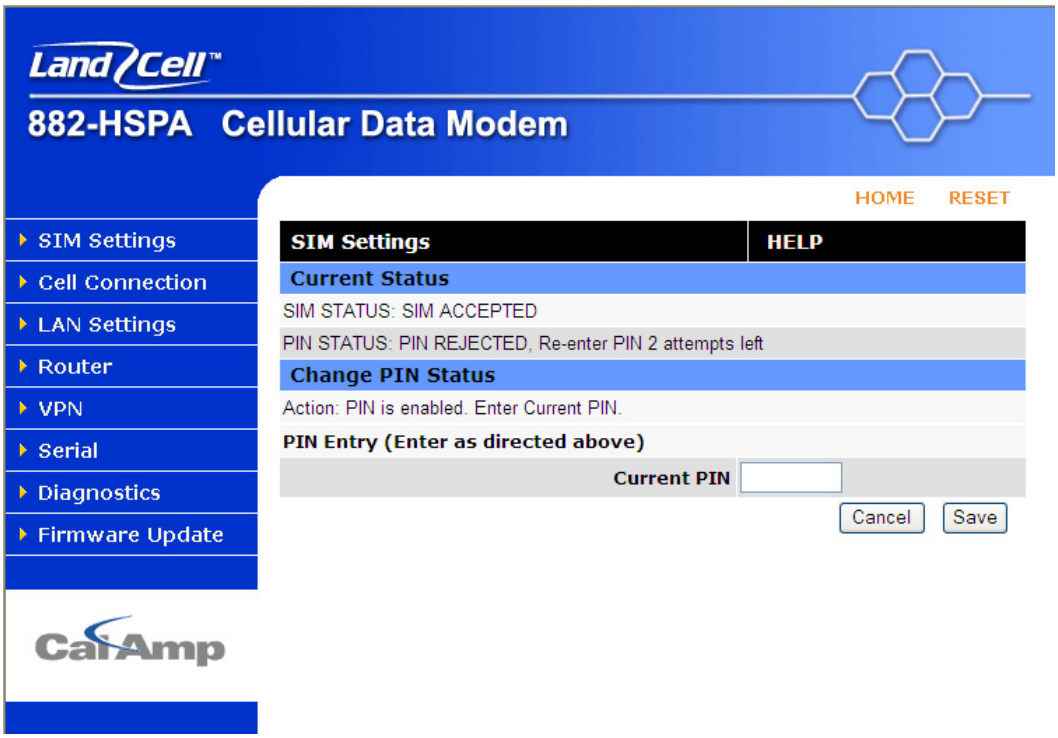


Figure 4.4: PIN status rejected

Figure 4.5 shows the SIM page requiring the unlock code to be entered. At this point the user has 10 attempts to enter the correct unlock code or the SIM card will be rendered unusable.

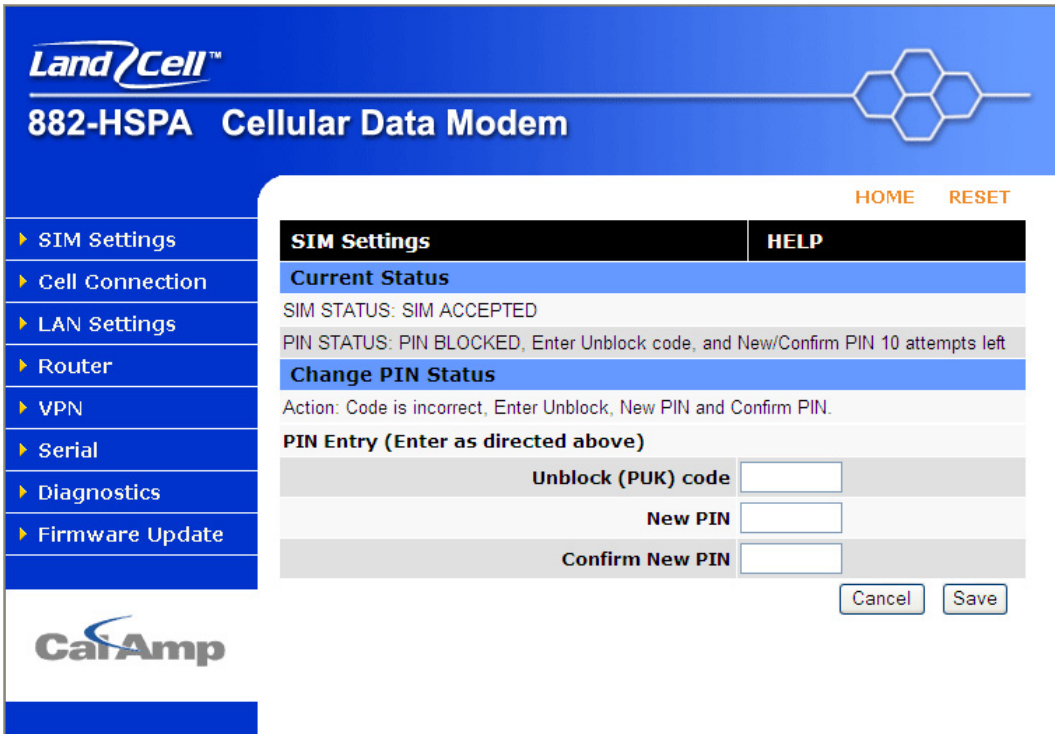


Figure 4.5: PIN unlock code required

PIN security options

After PIN security has been enabled, the SIM page will display three options for changing the PIN functionality, **Remember PIN**, **Disable PIN**, or **Change PIN**. Only one of these options can be changed and saved at a time.

Remember PIN

Selecting **YES** will allow the modem to remember the security PIN making it unnecessary to enter the PIN each time the modem tries to connect to the network. Selecting **NO** will set the modem to not remember the current PIN, requiring the user to enter the PIN when requested. Since only the modem remembers the PIN, using the SIM card in a different modem will require PIN authorization to dial out.

Disable PIN

Selecting **YES** will disable the PIN security feature; the current PIN will need to be entered to allow disabling. A selection of **NO** indicates that PIN security is enabled.

Change PIN

Selecting **YES** will allow the user to change the current PIN to a new one. Selecting **NO** will not require the user to change the PIN in the New PIN and Confirm PIN fields. When changing PINs, the user is required to input the current PIN, the new PIN, and the new PIN again in the fields provided.

After one of the options is changed, click the **SAVE** button to refresh the page showing the changes.

SECTION 5 – DIAL SETTINGS

Selecting **Cell Connection** from the left menu bar, then the Dial Settings tab, brings up the dial settings page. This provides the interface to configure dialing properties for initiating a data call with the cellular provider. Refer to Figures 5.1 and 5.2 below.

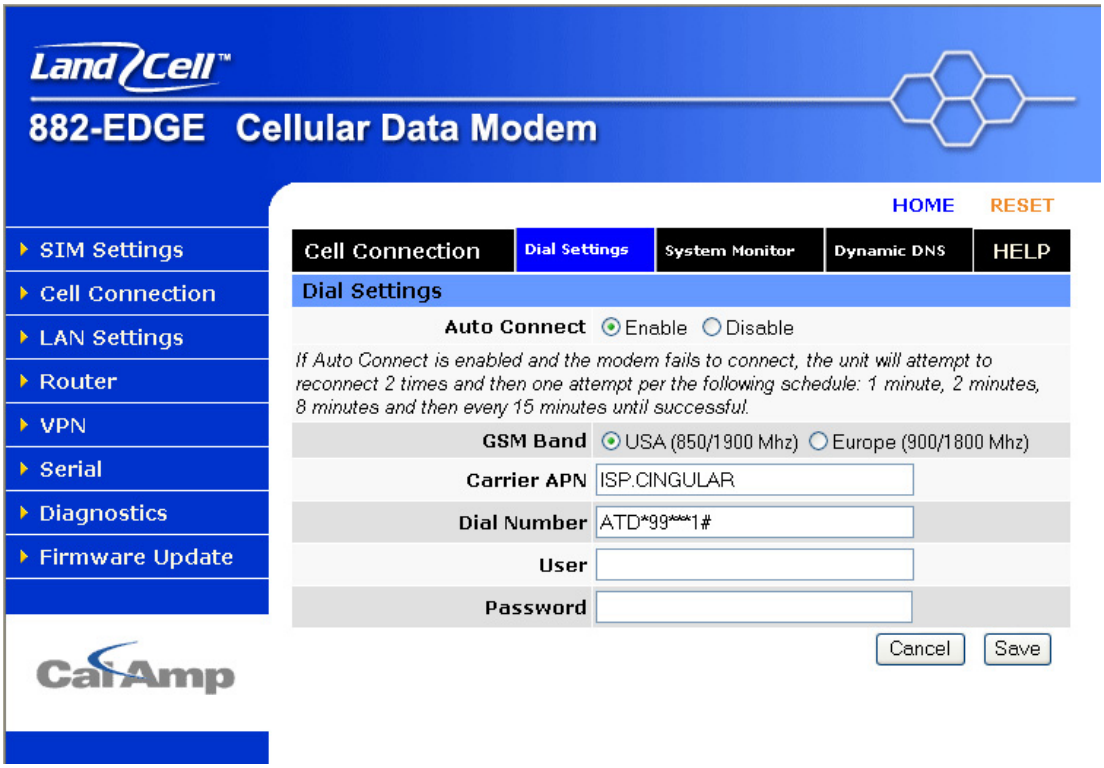


Figure 5.1: Dial Settings Page 882-GPRS/EDGE

Dial Settings for GPRS/EDGE

Auto Connect:
When set to **Enable**, will allow the modem to automatically dial the connection when the modem is powered and will also auto-reconnect if power is cycled. When set to **Disable**, the modem will not dial the connection to the cellular provider.

GSM Band:
Selecting **"USA"** sets the modem to use the 850/1900 MHz GSM band. Selecting **"Europe"** sets the modem to use the 900/1800 MHz GSM band.

Carrier APN:
The Access Point Name provided by the cellular provider required to access the network.

Dial Number:
The phone number used to initiate a data connection to the cellular provider via PPP.

User:
Sets the username required by the cellular provider. Leave blank if not required.

Password:
Sets the password required by the cellular provider. Leave blank if not required.

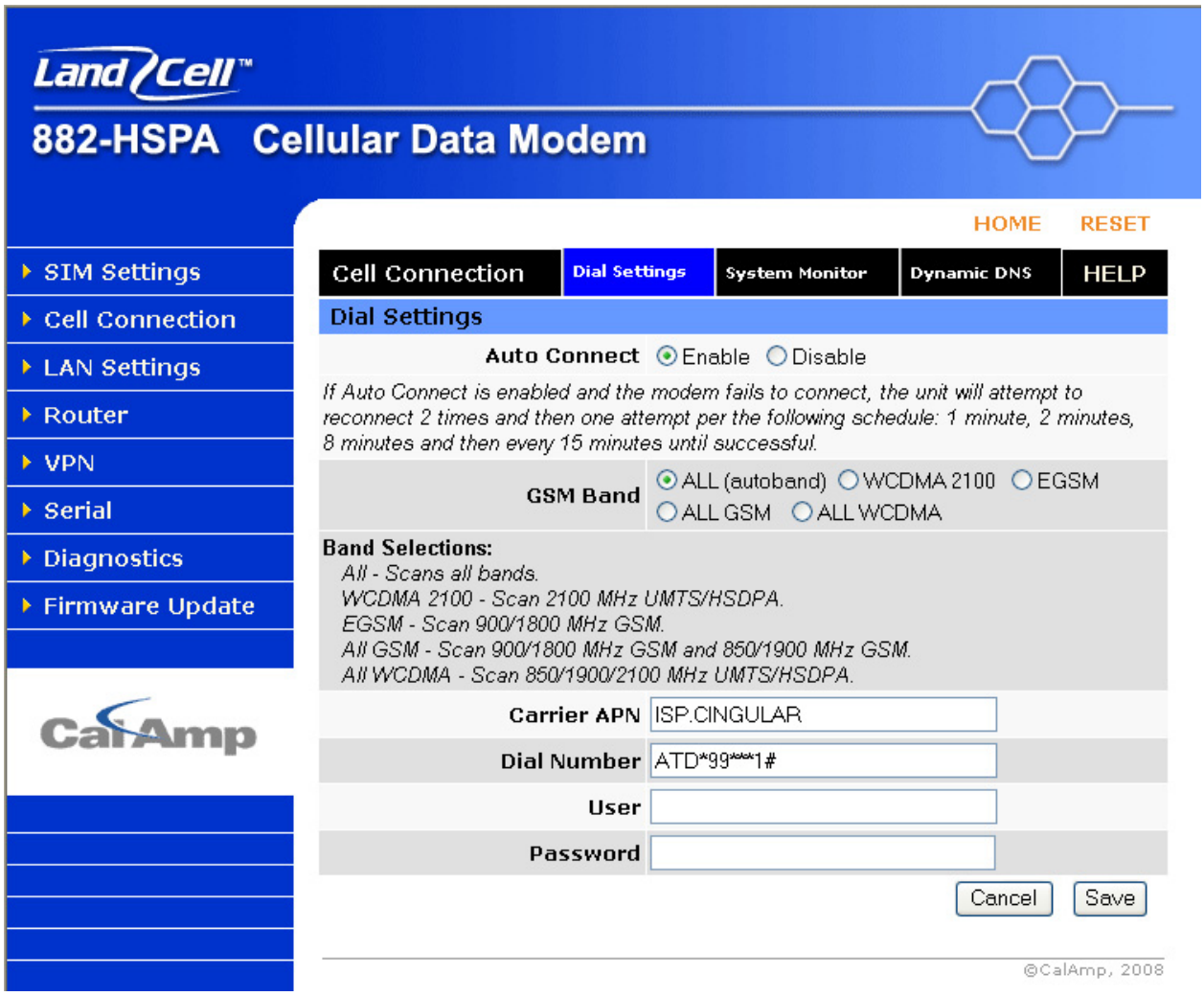


Figure 5.2: Dial Settings Page 882-HSPA

Dial Settings for HSPA

Auto Connect:
When set to **Enable**, will allow the modem to automatically dial the connection when the modem is powered and will also auto-reconnect if power is cycled. When set to **Disable**, the modem will not dial the connection to the cellular provider.

For 882-GPRS and 882-EDGE units (Figure 5.1):

GSM Band:
Select USA (850/1900MHz) or Europe (900/1800MHZ)

For the 882-HSPAunits (Figure 2.2):

GSM Band selection is as follows:

Band Selection: Configures the unit to operate on only the selected bands if available. We recommend leaving this on "ALL."

ALL –	All available bands will be accessible, commonly called autoband (default)
WCDMA 2100 -	Uses the 2100MHz frequency band used by the UMTS/HSDPA networks
EGSM -	Uses the 900/1800 MHz European GSM frequency band
ALL GSM -	Can use any available GSM band. Europe (900/1800MHz) or USA (850/1900MHz)
ALL WCDMA -	Can use any available WCDMA band, 850/900/2100 MHz in UMTS/HSDPA networks

Carrier APN: The Access Point Name provided by the cellular provider required to access the network.

Dial Number: Field to input the phone number to initiate a data connection to the cellular provider via PPP. The default dial number is ATD*99***1#.

User: Field to input the username required by the cellular provider. Leave this field blank if a user name is not required by your cellular provider.

Password: Field to input the password required by the cellular provider. Leave blank if a password is not required by your cellular provider.

The **SAVE** button must be pressed for changes to take effect.

SECTION 6 – MAC FILTERING

Selecting **LAN Settings** from the left menu bar, then the MAC Filtering tab, brings up the MAC filtering configuration page. MAC filtering allows up to **five** unique device MAC addresses access to the network.

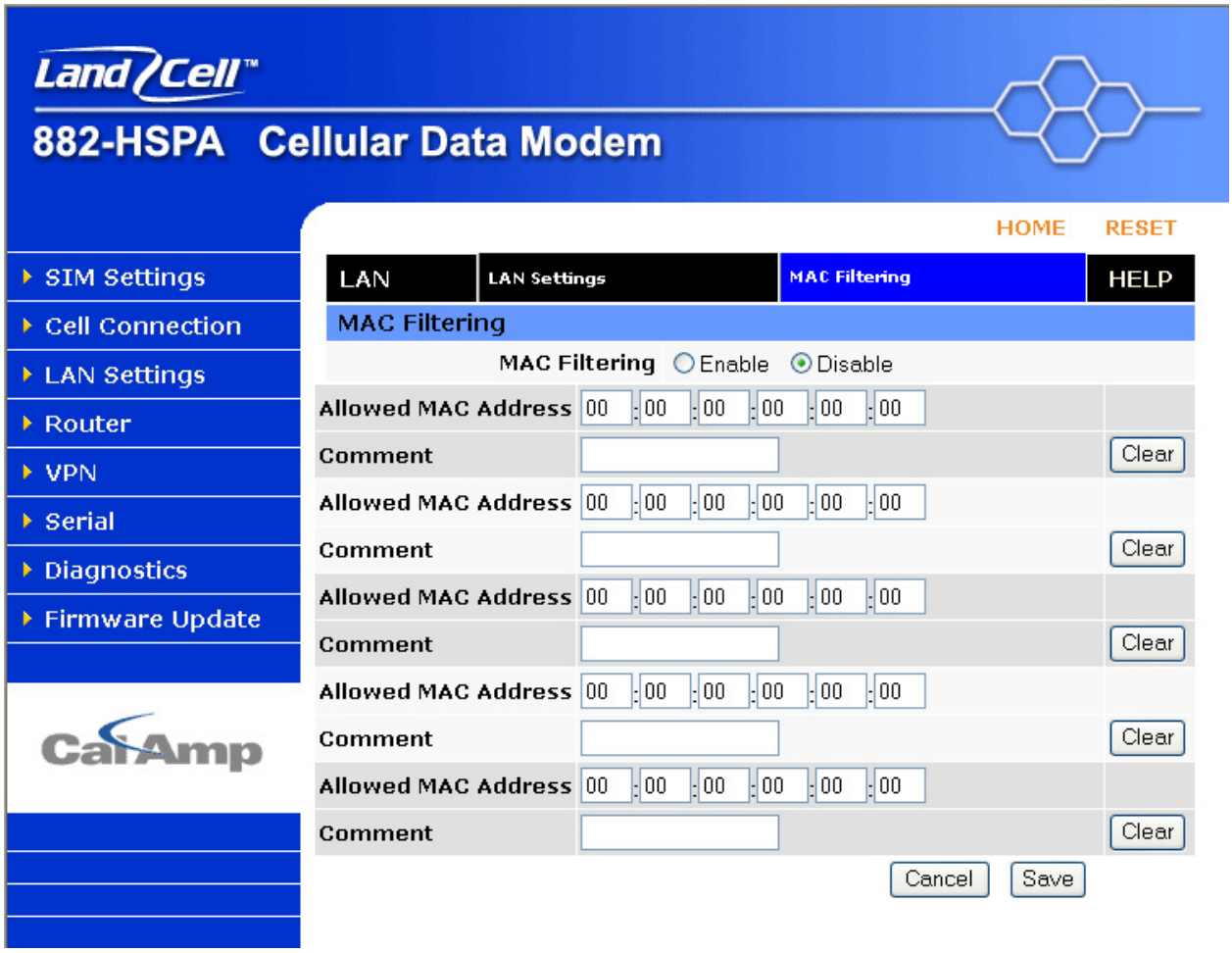


Figure 5.1: MAC Filtering Page

MAC Filtering Support

MAC Filtering: Select **Enable** to allow MAC filtering. Up to **five** unique MAC addresses can be allowed to access the network. Selecting **Disable** will stop the MAC filtering functionality.

Allowed MAC Address: Input MAC address to be allowed access to the network. Up to five addresses may be input.

Comment: Input name or short description of the device using the allowed MAC address. This field is limited to 32 characters.

Selecting **Clear** will remove the MAC address from the list of allowed addresses.

The **SAVE** button must be pressed for changes to take effect.

SECTION 7 – LAN CONFIGURATION

Selecting **LAN Settings** from the left menu bar brings up the LAN settings configuration page. From this page the modem's IP address, DNS settings, DHCP settings, and Remote Administration parameters are configured. Refer to Figure 7.1 below.

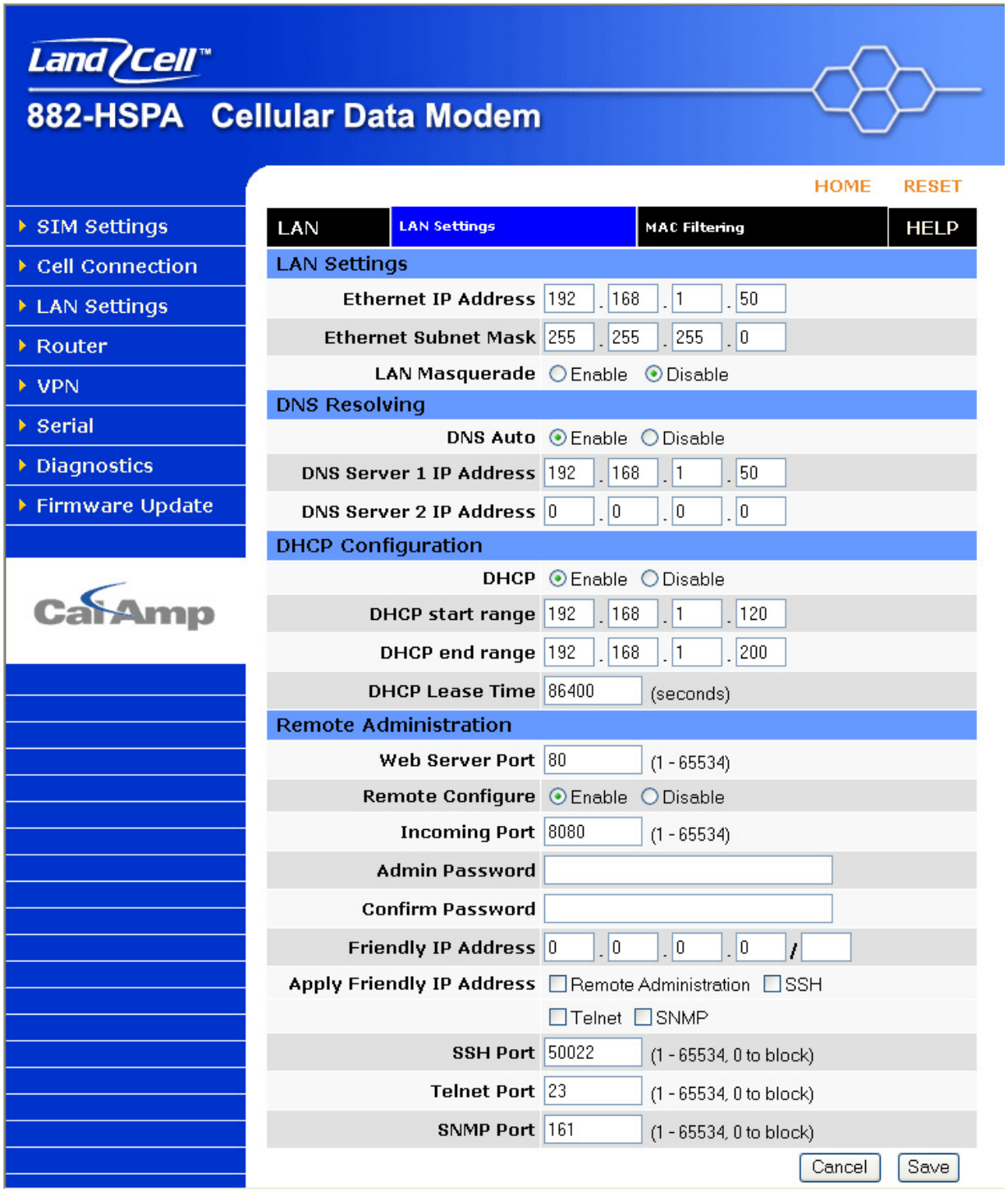

Land Cell
882-HSPA Cellular Data Modem
HOME
RESET
SIM Settings
Cell Connection
LAN Settings
Router
VPN
Serial
Diagnostics
Firmware Update
CalAmp
LAN
LAN Settings
MAC Filtering
HELP
LAN Settings
Ethernet IP Address 192 . 168 . 1 . 50
Ethernet Subnet Mask 255 . 255 . 255 . 0
LAN Masquerade Enable Disable
DNS Resolving
DNS Auto Enable Disable
DNS Server 1 IP Address 192 . 168 . 1 . 50
DNS Server 2 IP Address 0 . 0 . 0 . 0
DHCP Configuration
DHCP Enable Disable
DHCP start range 192 . 168 . 1 . 120
DHCP end range 192 . 168 . 1 . 200
DHCP Lease Time 86400 (seconds)
Remote Administration
Web Server Port 80 (1 - 65534)
Remote Configure Enable Disable
Incoming Port 8080 (1 - 65534)
Admin Password
Confirm Password
Friendly IP Address 0 . 0 . 0 . 0 /
Apply Friendly IP Address Remote Administration SSH
Telnet SNMP
SSH Port 50022 (1 - 65534, 0 to block)
Telnet Port 23 (1 - 65534, 0 to block)
SNMP Port 161 (1 - 65534, 0 to block)
Cancel
Save

Figure 7.1: LAN Configuration Page

LAN Configuration

Ethernet IP Address:
This sets the IP address of this device and is the address used to access the configuration pages. If the IP address changes you will have to re-enter the new IP address in your browser to access the configuration pages. The default IP is 192.168.1.50 and should be changed for security purposes.

Ethernet Subnet Mask:
This sets the subnet mask for the LAN side of the modem to the device. The default subnet mask is set to 255.255.255.0.

LAN Masquerade:
When enabled the LandCell directs all Ethernet traffic coming from the tethered Ethernet device to the Ethernet IP address of the LandCell. This should be enabled when the tethered device is an Ethernet server, and it does not have the ability to point Ethernet traffic to a gateway.

DNS Resolving
Domain Name System operates like a phone book to translate domain names (i.e., google.com) to IP addresses (70.212.19.1).

DNS Auto:
Selecting **Enable** will allow the servers set as DNS Server 1 or 2 to automatically resolve domain names to the DNS IP addresses assigned by the cellular network. These servers communicate with name servers by sending DNS queries and heeding DNS responses. Selecting **Disable** will not allow DNS Server 1 or 2 to resolve domain names to prevent unauthorized users from web surfing.

DNS Server 1 IP Address:
The Ethernet IP address of the preferred DNS server. The default address is 192.168.1.50, the same as the LAN Ethernet IP Address of the modem. If the LAN Ethernet ID Address changes, the DNS Server 1 address will automatically change to the same.

DNS Server 2 IP Address:
Ethernet address of the alternate DNS server. The default is set to 0.0.0.0.

DHCP Configuration

DHCP:
Dynamic Host Configuration Protocol; a protocol used by client devices that are connected to the LAN port of this device to automatically obtain an IP address assigned by this device. Selecting **Enable** will configure this device to assign IP addresses to client devices taken from a pool specified by the values entered in **DHCP start range** and **DHCP end range**. Selecting **Disable** will turn off this DHCP server functionality to prevent unauthorized users from getting an IP address assignment.

DHCP start range:
DHCP server starting IP address. The default start range is set to 192.168.1.120-200

DHCP end range:
DHCP server ending IP address. The largest settable number is 253.

DHCP Lease Time:
Sets the duration, in seconds, the connected device is allowed to keep the assigned IP address. The default lease time is set to 86400 seconds (24 hours). In many cases it is possible for the device to receive the same IP address after the lease time expires.

Remote Administration

Web Server Port:
Enter the port number to be used by the LandCell local web server. This can be changed if there is a port conflict with an external device. As an example, when the remote Ethernet device is restricted to port 80 only, the local port can now be changed to another unreserved port.

Remote Configure:
Selecting **Enable** will allow remote access to the modem's configuration screens through the cellular network connection. Selecting **Disable** will shut off the ability to remotely access the modem's configuration screens.

Incoming Port:
Sets the port number used to remotely configure the modem through the cellular network connection.

Admin Password:
Sets the password required for remote Internet configuration. Passwords are lower case only.

Confirm Password:
Re-type the Admin Password to confirm the correct spelling.

Friendly IP Address:
This specifies a remote IP address that is allowed to access the modem. A wildcard IP address of 0.0.0.0 allows all remote IP address to access the modem.

A source IP entry range may be created by inserting the number of bits for a network mask in the fifth (after the /) box. This allows traffic from the IP addresses on the designated sub network and port number to be forwarded. A list of up to 32 entries can be created at a time.

If only one entry is desired, leave the box after the / blank. Large ranges will take several seconds to fully process.

Apply Friendly IP Address:
Check the box next to a service to allow remote access to the service only from the friendly IP address. Un-checking the box or leaving all 0's will allow any IP address access.

Telnet, SSH and SNMP Ports (SSH and SNMP for future release):
Enter the port number that will be used for remote access to the service. Entering zero for the port number will block remote access to the service. If you must use a specific port for the remote, you can change the port on the LandCell to an unreserved port for Telnet.

The **SAVE** button must be pressed for changes to take effect.

SECTION 8 – DMZ / PORT FORWARDING SETTINGS

Selecting **Router** from the left menu bar, then the Port Forwarding tab, brings up the port forwarding configuration page. Port Forwarding is a technique for transmitting and receiving network traffic through a router that involves re-writing the source and/or destination IP addresses and usually the TCP/UDP port numbers of IP packets as they pass through. The various routing configurations will be displayed in the IP mapping table at the bottom of the screen.

DMZ is a host on the internal network that has all ports exposed, except those ports forwarded otherwise. Refer to Figure 8.1 below.

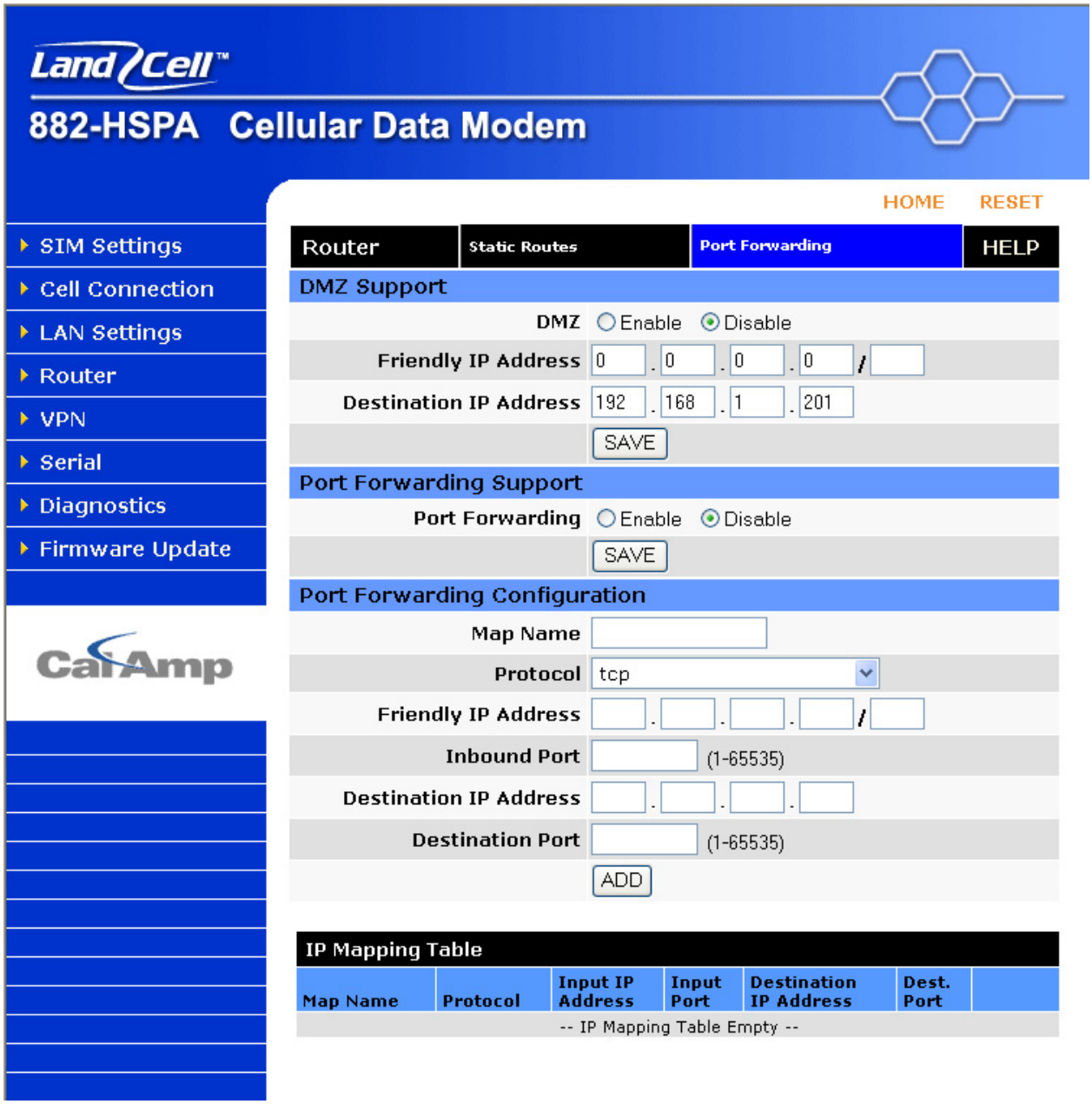


Figure 8.1: DMZ/Port Forwarding configuration page

DMZ Support

DMZ:
When set to **Enable**, will allow the modem to use DMZ routes using the address set in the Destination IP Address. When set to **Disable**, will shut down the DMZ functionality. This can be used when one Ethernet device per modem is used. DMZ will forward all ports to the device except for the ports already specified, see below:

Web server port, remote administration incoming port, SSH port, Telnet port, SNMP port and incoming serial PAD ports, and any ports listed in the IP mapping table.

The **SAVE** button must be pressed for changes to take effect.

Friendly IP Address:
This specifies a remote IP address that is allowed to access the modem. A wildcard IP address of 0.0.0.0 allows all remote IP address to access the modem.

A source IP entry range may be created by inserting the number of bits for a network mask in the fifth (after the /) box. This allows traffic from the IP addresses on the designated sub network and port number to be forwarded. A list of up to 32 entries can be created at a time.

If only one entry is desired, leave the box after the / blank. Large ranges will take several seconds to fully process.

Destination IP Address:
The IP address of the tethered device for which all unreserved ports will be forwarded to.

Port Forwarding Support

Port Forwarding Enable:
When set to Enable, will allow the modem to use the Port Forwarding routes described in the IP mapping table. When set to Disable, will shut down the Port Forwarding functionality.

The **SAVE** button must be pressed for changes to take effect.

Port Forwarding Configuration

Map Name:
This sets the mapping name for the IP mapping table at the bottom of the screen.

Protocol:
This sets the data protocol as either *tcp*, *udp*, or *all*.

Friendly IP Address:
This specifies a remote IP address that is allowed to access the modem. A wildcard IP address of 0.0.0.0 allows all remote IP address to access the modem.

A source IP entry range may be created by inserting the number of bits for a network mask in the fifth (after the /) box. This allows traffic from the IP addresses on the designated sub network and port number to be forwarded. A list of up to 32 entries can be created at a time.

If only one entry is desired, leave the box after the / blank. Large ranges will take several seconds to fully process.

Inbound Port:
This sets the external port number for incoming requests. To avoid conflict, never reuse any of the same ports as described in the DMZ section above.

Destination IP Address:
The IP address of the tethered device for which the port specified in the inbound port field will be forwarded to.

Destination Port:
This sets the LAN port number used when forwarding to the destination IP address.

As an example, if it were required that all incoming addresses using port 81 and 8081 be routed to IP address 192.168.1.222 on port 80 then the following information would be entered.

First, set the mapping name to 1, set the protocol to *all*, set the input IP address to 0.0.0.0 and the incoming port to 81, set the destination IP address to 192.168.1.222 and the destination port to 80, then click the **ADD** button. This will set the first entry in the table as Item 1.

To route port 8081 as well, enter a mapping name of 2, set the protocol to *all*, set the input IP address to 0.0.0.0 and the incoming port to 8081, then set the destination IP address and port to the same values as before and click the **ADD** button. A second entry will be created as item 2, shown in Figure 9.2 below.

IP Mapping Table

Map Name	Protocol	Input IP Address	Input Port	Destination IP Address	Dest. Port	
1	all	0.0.0.0	81	192.168.1.222	81	Delete Entry
2	all	0.0.0.0	8081	192.168.1.222	80	Delete Entry

Figure 9.2: Port Forwarding Mapping Table example 1

As a second example, add the requirement to forward information from IP address 66.94.234.13, port 8083 to IP address 192.168.1.223, port 8083 using the tcp protocol.

Enter a mapping name of 3, set the protocol to *tcp*, set the input IP address to 66.94.234.13 and the incoming port to 8083, then set the destination IP address to 192.168.1.223 and the destination port to 8083, then click the **ADD** button. A third entry will be created as item 3, shown in Figure 9.3 below.

IP Mapping Table

Map Name	Protocol	Input IP Address	Input Port	Destination IP Address	Dest. Port	
1	all	0.0.0.0	81	192.168.1.222	81	Delete Entry
2	all	0.0.0.0	8081	192.168.1.222	80	Delete Entry
3	tcp	192.168.2.100	8083	192.168.1.223	8083	Delete Entry

Figure 9.3: Forwarding Mapping Table example 2

SECTION 9 – DYNAMIC DNS

Selecting **Router** from the left menu bar, then the Dynamic DNS tab, brings up the dynamic DNS configuration page. Dynamic DNS is a system which allows the domain name data of a computer with a varying (dynamic) IP addresses held in a name server to be updated in real time in order to make it possible to establish connections to that machine without the need to track the actual IP address themselves at all times. A number of providers offer Dynamic DNS services ("DDNS"), free or for a charge. For example, a free service provided by NO-IP allows users to setup between one and five host names on a domain name provided by NO-IP. No-IP is the default DNS service.

NOTE: Dynamic DNS is compatible with the NO-IP service; it is the customer's responsibility to verify other Dynamic DNS services are NOIP compatible.

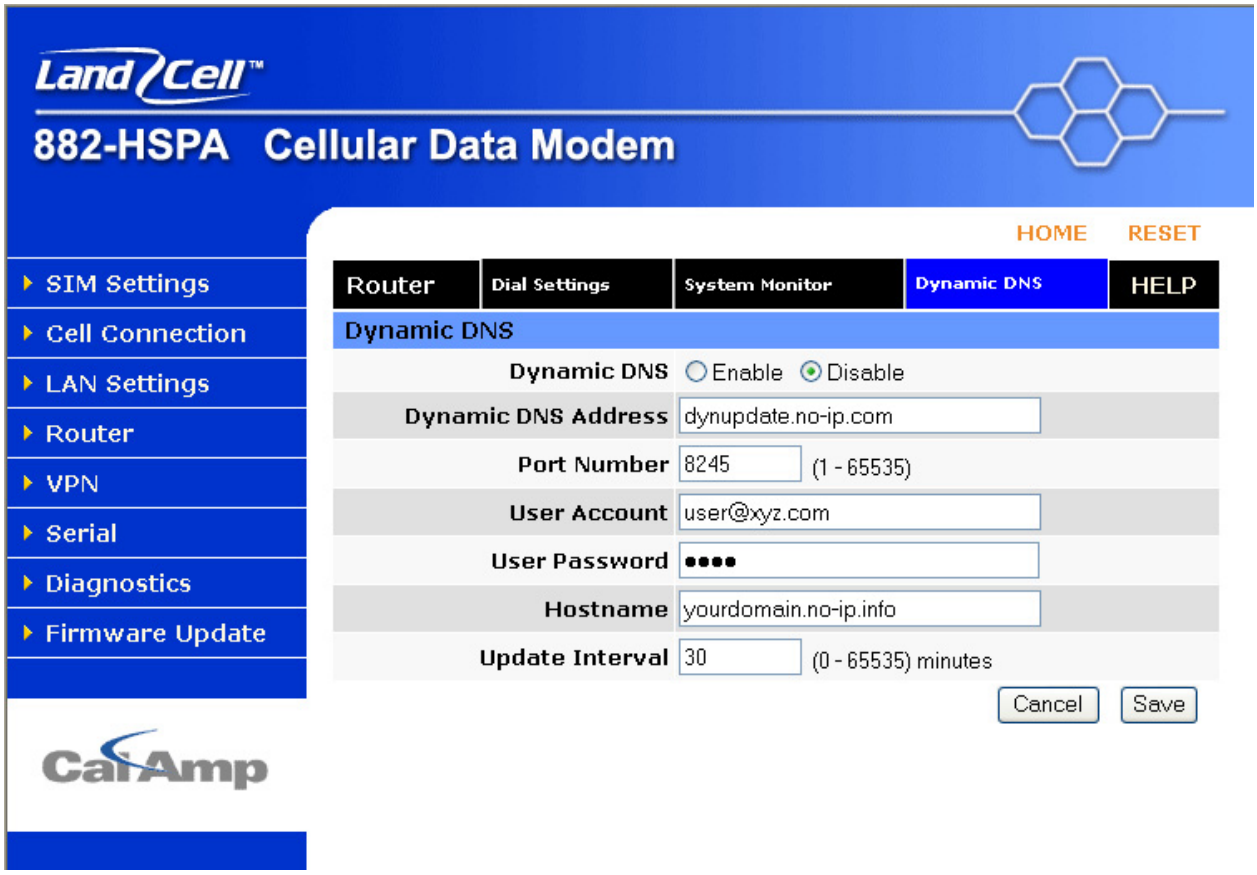


Figure 9.1: Dynamic DNS configuration page

Dynamic DNS:
Selecting **Enable** will allow the modem to provide the selected service dynamic IP address information. Selecting **Disable** will stop any IP information from being sent to the selected service.

Dynamic DNS Address:
The internet address to communicate the Dynamic DNS information to. Default is dynupdate.no-ip.com.

Port Number:
The port number for the internet address given above. Default is 8245.

User Account:
The username used when setting up the account. Used to login to the Dynamic DNS service.

User Password:
The password associated with the username account.

Hostname:
The hostname identified to the Dynamic DNS service. For example *http:/test.myserver.com*. Put in the browser to connect to the unit remotely instead of the WAN IP address.

Update Interval:
Sets the interval, in minutes (0 to 65,535), the modem will update the Dynamic DNS server of its carrier assigned IP address. It is recommended to set this interval as long as necessary. Note: Each update is considered a data call by the cellular provider and could deplete low usage data plan minutes.

This may not be necessary because every time the IP address is changed, or a reboot occurs, the device sends out a notification. This can then be usually set at zero.

The **SAVE** button must be pressed for changes to take effect.

SECTION 10 – ROUTER SETTINGS

Selecting **Router** from the left menu bar, then the Static Routes tab, brings up the routing configuration page. Static route tables are created from the Routing screen and appear at the bottom. Static Routing refers to a manual method used to set up routing between networks.

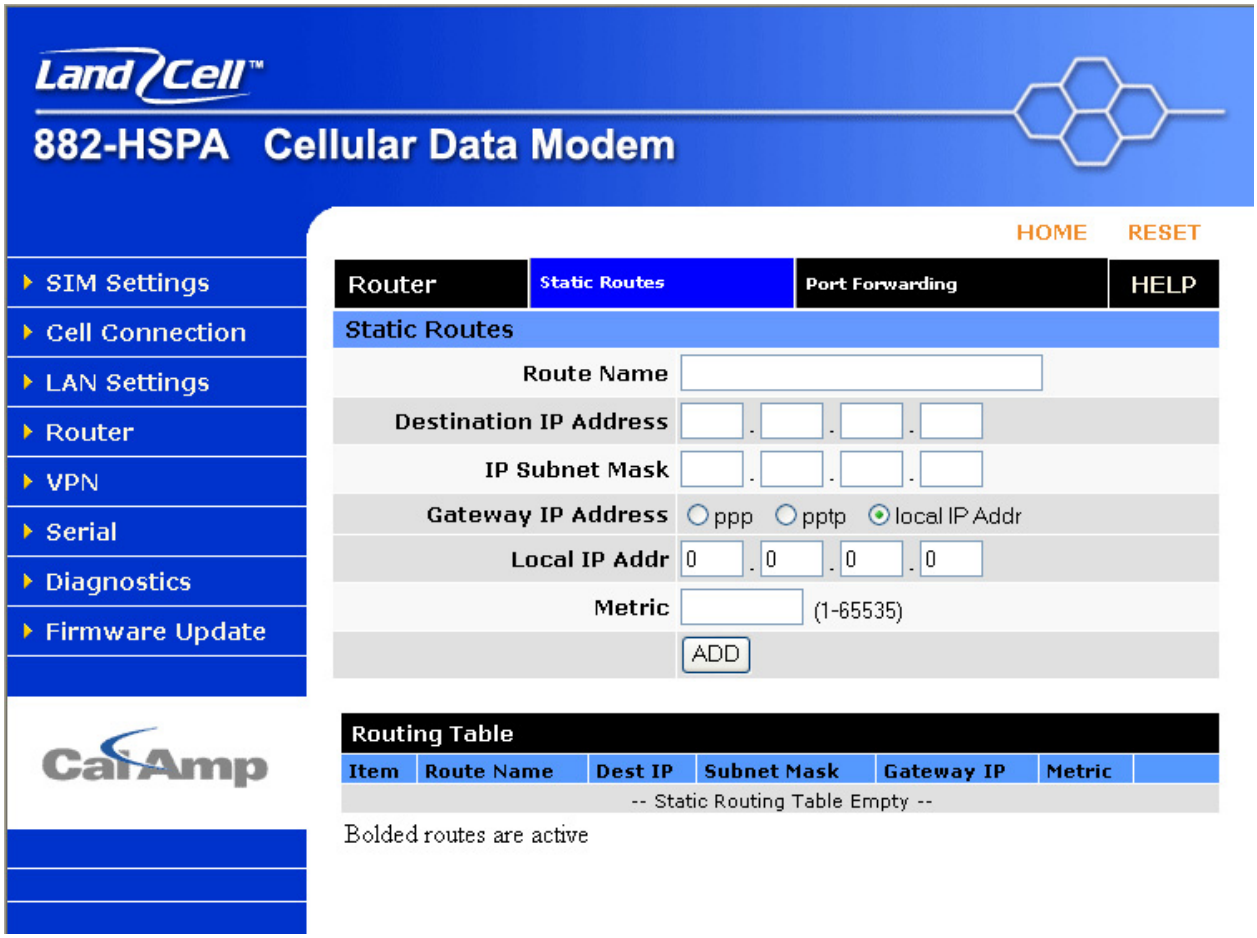


Figure 10.1: Router Settings Page

Static Routes

Route Name:
Sets the alphanumeric identifier of the static route in the Static Route Table.

Destination IP Address:
Routes matching this destination IP address will be routed to the static route defined in the Local IP address field.

IP Subnet Mask:
Sets the subnet mask of the destination network.

Gateway IP Address:
Selects ppp (this modem's wireless internet connection), pptp (VPN Client), or the local network IP address for the gateway to the destination address. As an example, data by default will go through ppp. But if pptp (VPN Client) is on, routing can go around the VPN by selecting ppp.

Local IP Address:
This is only used if *local IP Addr* was selected for gateway. Enter the address of the local gateway.

Metric:
Number ranging from 1 to 20. The lower the metric value the higher the route priority.

The **ADD** button must be pressed to add the configured route to the Static Route Table.

As an example, if a router connected on the Ethernet side of the modem has a gateway IP address of 192.168.1.2 and is interfaced to network 192.168.2.0 the following would be entered in the Static Route Table to allow a device to get on the 192.168.2.0 network.

Set the Route Number to 1, name the Route (i.e. Route1), set the destination IP Address to 192.168.2.0, set the IP Subnet Mask to 255.255.255.0, set the Gateway IP Address to 192.168.1.2, and set the Metric to 1. The entry will be made in the Static Route Table, Figure 11.2 below.

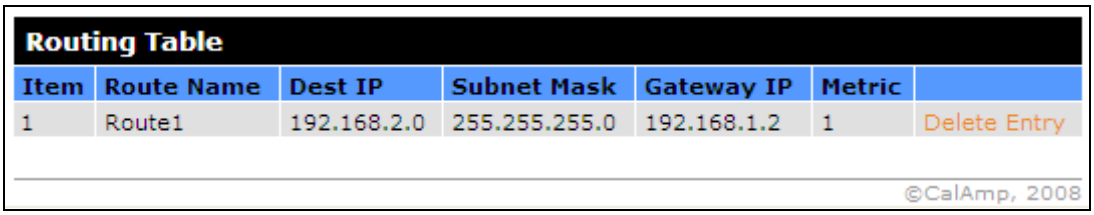


Figure 11.2: Static Route Table example

SECTION 11 – SIMPLE NETWORK MANAGEMENT PROTOCOL (SNMP, FOR FUTURE RELEASE)

Selecting **Diagnostics** from the left menu bar, then the SNMP tab, brings up the Simple Network Management Protocol configuration page. SNMP is used in network management systems to monitor network-attached devices for conditions that warrant administrative attention. SNMP version v1 is supported.

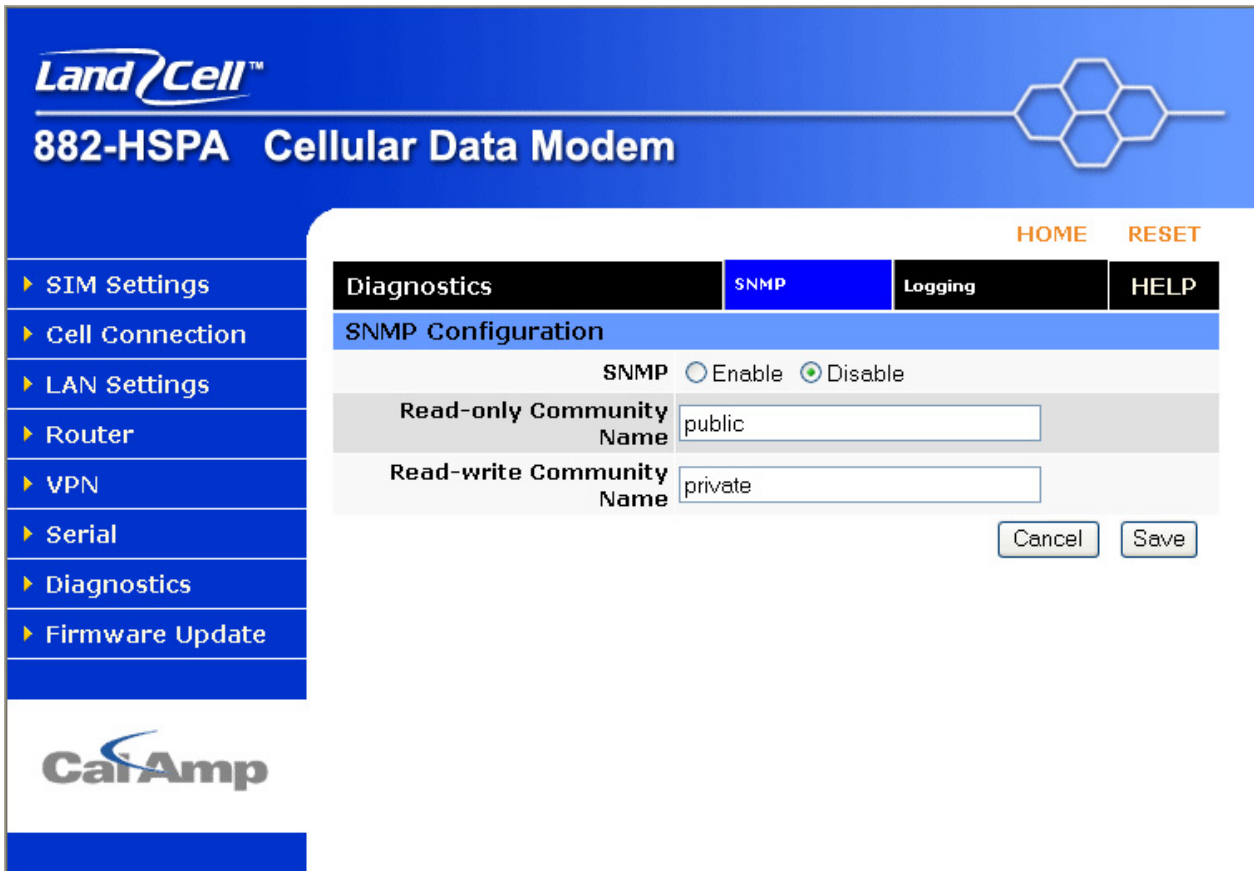


Figure 11.1: SNMP Settings page

SNMP Configuration

SNMP:
Selecting **Enable** will allow the SNMP functionality. Selecting **Disable** will shut off SNMP functionality.

Read-only Community Name:
The community string used for accessing the read-only Management Information Bases (MIBs).

Read-write Community Name:
The community string used for accessing all Management Information Bases (MIBs) including writable MIBs.

The **SAVE** button must be pressed for changes to take effect.

SECTION 12 – POINT-TO-POINT TUNNELING PROTOCOL SETTINGS

Selecting **VPN** from the left menu bar will display the Point-to-Point Tunneling Protocol (PPTP) configuration page. PPTP is a method to implement a virtual private network (VPN).

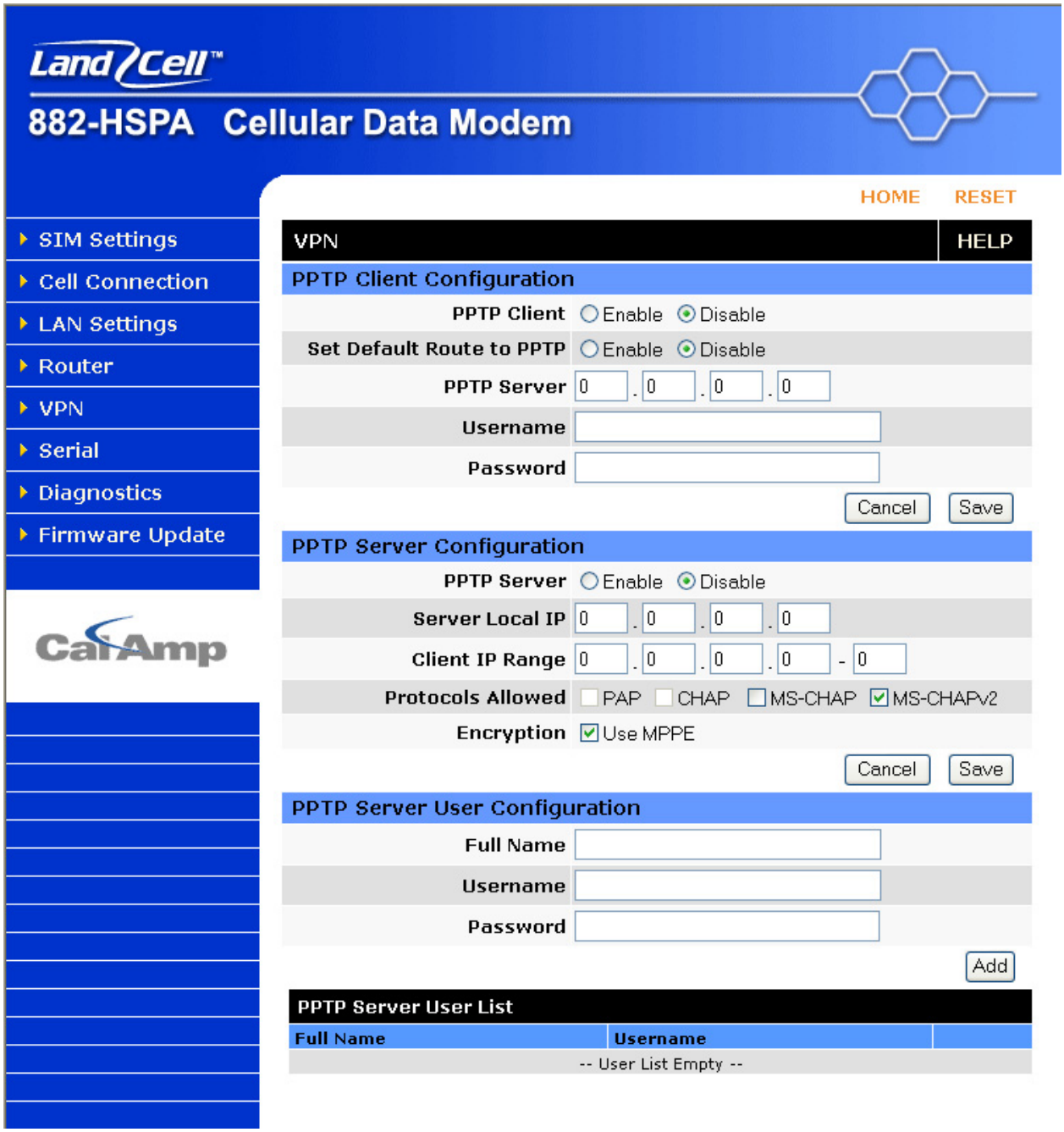


Figure 12.1: PPTP Settings page

PPTP Client Configuration

PPTP Client:
Selecting Enable will allow the PPTP functionality. Selecting Disable will shut off PPTP functionality.

Set Default Route to PPTP:
Selecting Enable will route all IP traffic through the PPTP connection. Selecting Disable will not route IP traffic through the PPTP connection.

PPTP Server:
The IP address of the VPN server listening for inbound connections.

Username:
The username required by the VPN server.

Password:
The password, associated with the username, required by the VPN server.

The **SAVE** button must be pressed for changes to take effect.

PPTP Server Configuration

PPTP Server:
Selecting Enable starts our VPN server listening for an inbound connection, and selecting Disable stops it.

Server Local IP:
The IP address that our modem gives the remote client.

Client IP Range:
The pool of IP addresses assigned to remote clients.

Protocols Allowed:
Selecting a protocol will instruct the VPN server to accept clients who use that authentication protocol. The server will reject clients using any of the un-selected protocols.

Encryption:
Selecting 'Use MPPE' will enable Microsoft Point-to-Point Encryption for communication between the server and clients. This option requires the MS-CHAP or MS-CHAPv2 protocol.

The **SAVE** button must be pressed for changes to take effect.

PPTP Server User Configuration

Full Name:
This name can be used as a more descriptive name for a client. It is not used by the server. No spaces are allowed in the name.

Username:
The name used by a client to log in to the server.

Password:
The password, with associated username, used by a client to log in to the server.

SECTION 13 – EXTERNAL SERIAL PORT

Selecting **Serial** from the left menu bar, then the External Serial tab, brings up the serial port and PAD settings page. The External Serial screen is used to configure the RS-232 Serial Port parameters and Packet Assembler and Dis-assembler (PAD) functionality. This acts as a serial to IP (and IP to serial) converter without the need to purchase a separate serial to IP converter. Refer to Figure 13.1 below.

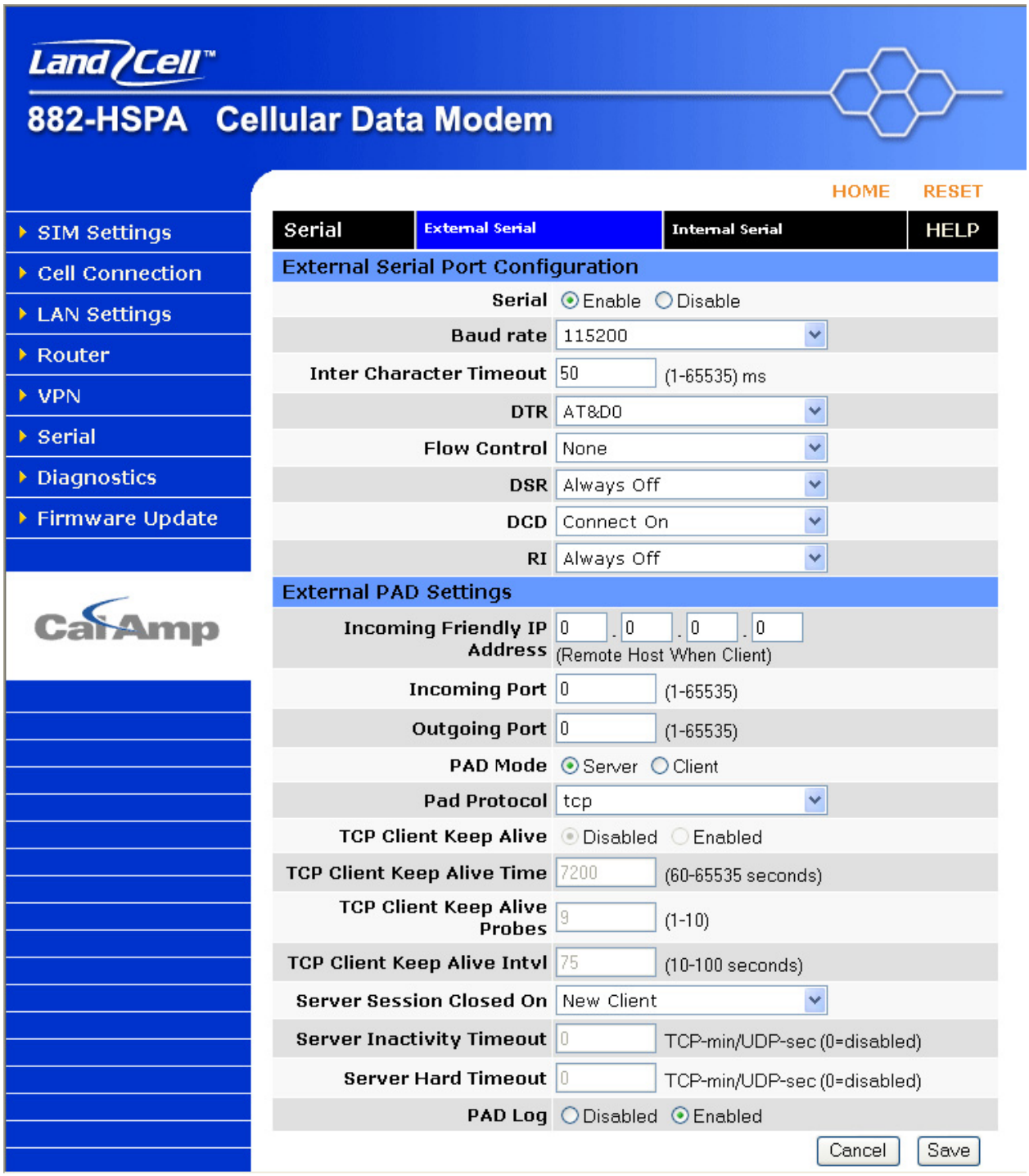


Figure 13.1 Serial Settings page

External Serial Port Configuration

Baud Rate:
Sets the baud rate of the serial port. Settings may range from 300 to 115,200 bits per second. The default baud rate is 115,200 bps.

Inter Character Timeout:
Sets the interval between packets being sent, no matter the size, from 1 to 65,535 ms.

DTR:
Defines the Data Terminal Ready behavior.

AT&D0: Ignore DTR.

AT&D1: If in the Online Data State, upon an on-to-off transition of DTR, the modem enters Online Command State and issues an OK result code; the call remains connected. Otherwise, ignore DTR.

AT&D2: If in the Online Data State or Online Command State upon an on-to-off transition of DTR, the modem performs an orderly clear-down of the call and returns to the command state. Automatic answer is disabled while DTR remains off.

AT&D4: The modem auto-dials the default remote station upon an off-to-on transition of DTR and enters the Online Data State. The modem ends the call and enters the command state upon an on- to-off transition of DTR.

AT&D5: The modem auto-dials the default remote station upon an on-to-off transition of DTR and enters the Online Data State. The modem ends the call and enters the command state upon an off-to-on transition of DTR.

AT&D6: Upon an on-to-off transition of DTR, the modem performs an orderly clear-down of any session and turns OFF the RF module. Upon an off-to-on transition of DTR, the modem turns ON the RF module and reestablishes the radio session.

AT&D7: Upon an on-to-off transition of DTR, the modem performs an orderly clear-down of any session and turns OFF the RF module. Upon an off-to-on transition of DTR, the modem turns ON the RF module and reestablishes the radio session.

AT&D8: The modem auto-dials the default remote station upon determining DTR is OFF and enters the Online Data State. The modem ends the call and enters the command state upon determining DTR is ON.

AT&D9: The modem auto-dials the default remote station upon determining DTR is ON and enters the Online Data State. The modem ends the call and enters the command state upon determining DTR is OFF.

Flow Control:
Sets the Flow Control to None or Hardware control.

DSR:
Sets the Data Set Ready to Always On, On When Available, On When Connected or Always Off. The DSR parameter determines how the modem controls the state of the Data Set Ready circuit.

Always On: DSR is always on.

On When Available: DSR is on when the RF signal present and phone registered on network.

On When Connected: DSR is on when connected to CDMA.

Always Off: DSR is always off.

The default value is **Always Off.**

CD:
The CD parameter determines how the modem controls the state of Carrier Detect and the amber CD LED on the front panel.

Always On: CD is always on.

Connect On: CD is on when connected to a remote host.

Always Off: CD is always off.

The default value is **Connect On.**

RI:
The RI parameter determines how the modem controls the state of the Ring Indicator circuit.

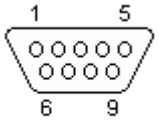
Always On: RI is always on.

Connect On: RI tracks incoming ring pulse.

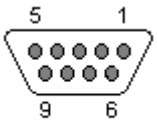
Always Off: RI is always off.

The default value is **Always Off.**

Pin	Name	Direction	Description
1	CD	«—	Carrier Detect
2	RX	«—	Receive Data
3	TX	—»	Transmit Data
4	DTR	—»	Data Terminal Ready
5	GND		System Ground
6	DSR	«—	Data Set Ready
7	RTS	—»	Request to Send
8	CTS	«—	Clear to Send
9	RI	«—	Ring Indicator



Male



Female

PAD Settings

Incoming Friendly IP Address:
This specifies a remote IP address that is allowed to access the modem. A wildcard IP address of 0.0.0.0 allows all remote IP address to access the modem.

Incoming Port:
Sets the port number used to forward incoming traffic to the serial port. Inbound traffic with this port will be forwarded to the serial port in client mode.

Outgoing Port:
Sets the port number used to send outbound traffic from the serial port. These will be packetized and sent to an external IP address and the port number specified.

PAD Mode:
Select buttons to set the PAD mode of the modem as a **Server** or **Client**.

Server mode waits for inbound TCP connections from remote client or UDP data being sent to the external modem's IP address. For example, server mode can be used for mobile termination calls. When in server mode, it is possible for the connected serial device to make an outbound TCP or UDP connection when an AT Command is issued (remote IP address: port number, e.g. ATD*166.23.42.10:5000).

Client mode keeps an always-on TCP connection to a remote server or sends all UDP to the IP address and port number specified. For example, client mode can be used for mobile origination calls.

Pad Protocol:
Sets the data protocol of the PAD to **TCP** or **UDP** data. If you have set **PAD Mode** as **server** you can choose **either** to support either type of data packets.

TCP Client Keep Alive:
When in client mode and enabled, TCP Keep Alive packets will be sent from the client to the server periodically in order to detect a broken connection. The modem will automatically try to re-establish the connection if necessary. Changing this setting will affect the use of TCP Keep Alive on the next client session. It will not affect an existing session.

TCP Client Keep Alive Time:
Time in seconds between keep alive cycles. A keep alive cycle will consist of one or more keep alive probes separated by the keep alive interval. If a keep alive time has no response the unit will send probes.

TCP Client Keep Alive Probes:
Number of keep alive packets that must fail before connection is considered closed.

TCP Client Keep Alive Intvl:
Time in seconds after which a keep alive packet is considered to be failed (if not acknowledged). Another packet is sent at this time if TCP Client Keep Alive Probes limit has not been reached.

Server Session Closed On:
This is only available if PAD mode is **Server**. This option selects under which conditions the server will terminate an established connection. (If the termination of the TCP current connection was not received properly by the modem then the connection will hang until the modem reboots or one of the two below methods is invoked.)

New Client: If a different client attempts to connect, it will be successful and the current client will be forcibly disconnected, without any warning.

Timeout: A new client will be accepted only after a specified timeout. The duration of the timeout is specified by the Inactivity timeout, or the Hard timeout, or a combination of both.

The default value is **New Client**.

Server Inactivity Timeout:
Time after which the current connection with **Client** will be terminated without warning. This time starts over again each time the **Client** sends data to the server. This parameter is ignored if the session closes on **New Client**. If PAD protocol is **tcp**, the timeout is specified in minutes. If **udp**, the timeout is specified in seconds. The valid range for either is 1-65535. 0 will disable this timer.

If both Inactivity Timeout and Hard Timeout are enabled, (neither is 0), then a client session will be terminated when either timeout is met. In this case, the value for Hard Timeout must exceed the value for Inactivity Timeout. If the Inactivity Timeout is met, the client will be terminated. If the Hard Timeout is exceeded without meeting the Inactivity Timeout, the client will be terminated by the Hard Timeout.

Server Hard Timeout:
Time after which the current connection with **Client** will be terminated without warning. This is a fixed time from the initial connection, no matter how much or how often the **Client** sends data to the server. This parameter is ignored if the session closes on **New Client**. If PAD protocol is **tcp**, the timeout is specified in minutes. If **udp**, the timeout is specified in seconds. The valid range for either is 1-65535. 0 will disable this timer.

If both Inactivity Timeout and Hard Timeout are enabled, (neither is 0), then a client session will be terminated when either timeout is met. In this case, the value for Hard Timeout must exceed the value for Inactivity Timeout. If the Inactivity Timeout is met, the client will be terminated. If the Hard Timeout is exceeded without meeting the Inactivity Timeout, the client will be terminated by the Hard Timeout.

PAD Log:
When enabled, as data passes through the PAD, a copy is stored in a log file located on the modem at /tmp/padlog. The log will stop saving data when full and data is lost at modem reset. This is only used for debugging purposes and isn't normally accessible by the user.

The **SAVE** button must be pressed for changes to take effect.

SECTION 14 – INTERNAL SERIAL PORT

Selecting **Serial** from the left menu bar, then the Internal Serial tab, brings up the serial port and PAD settings page. The Internal Serial screen is used to configure the internal RS232 Serial Port parameters and Packet Assembler and Dis-assembler (PAD) functionality. The PAD feature forwards requests that come in on a specific port to the internal serial port. Refer to Figure 14.1 below.

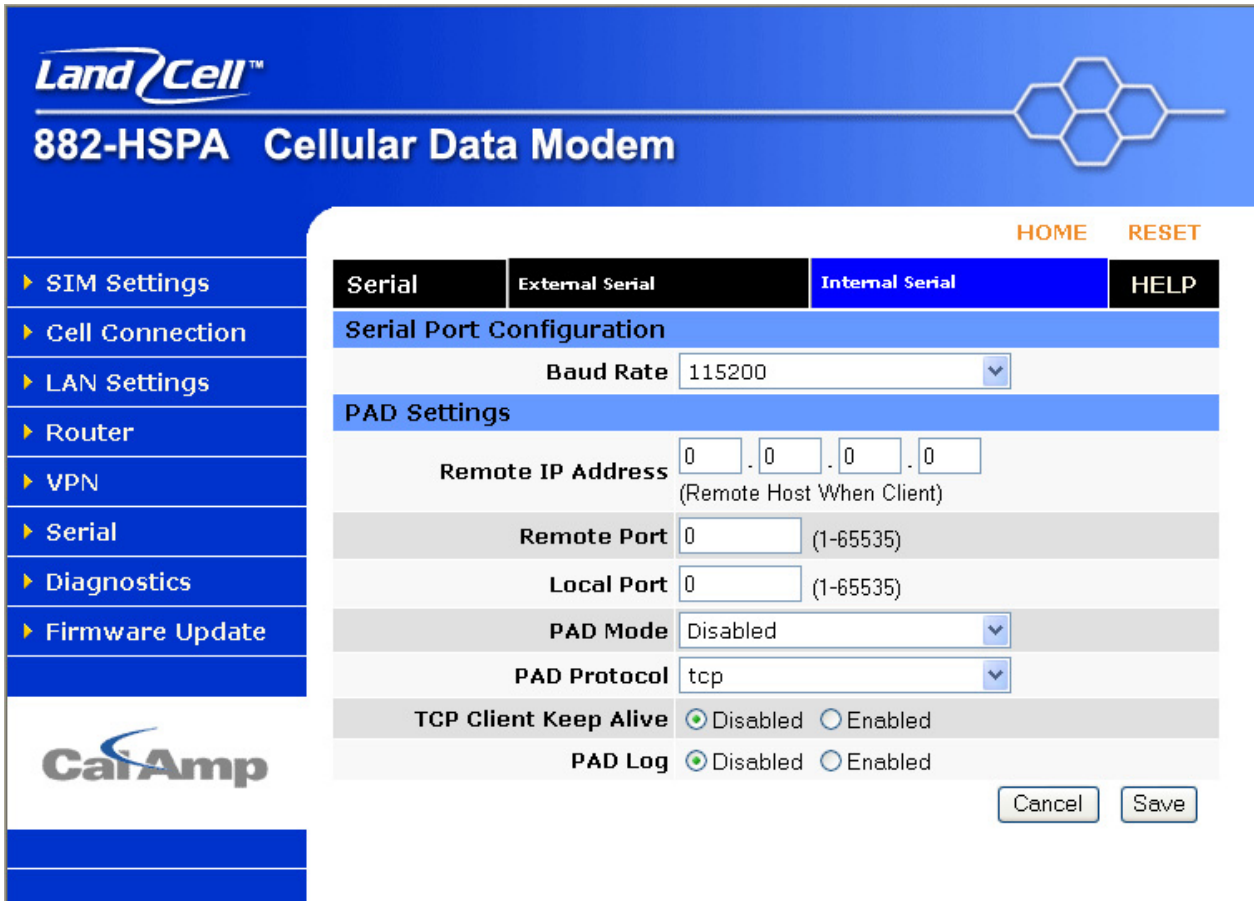


Figure 14.1: Internal Serial page

Serial Port Configuration

Baud Rate:
Sets the baud rate of the serial port. Settings may range from 300 to 115,200 bits per second. The default baud rate is 115,200 bps.

PAD Settings

Remote IP Address:
Sets the IP address of the device using the PAD functionality.

Remote Port:
Sets the port number used by the remote device to accept requests from the LandCell.
Local Port:
Sets the port number used by the LandCell to accept requests from the remote device.

PAD Mode:
Select buttons to set the PAD mode of the LandCell as a **Server** or **Client**.

Pad Protocol:
Sets the data protocol of the PAD to *tcp* or *udp* data.

TCP Client Keep Alive:

PAD Log:
If enabled, a log of the data passed through the modem is saved at /tmp/intpadlog. The log will stop saving data when full and data is lost at modem reset.

The **SAVE** button must be pressed for changes to take effect.

SECTION 15 – SYSTEM MONITOR

Selecting **Cell Connection** from the left menu bar, then the System Monitor tab, brings up the system monitor page. The System Monitor page allows the user to set up additional self-monitoring for the modem to determine when service provider connections may have been terminated. Refer to Figure 15.1 below.

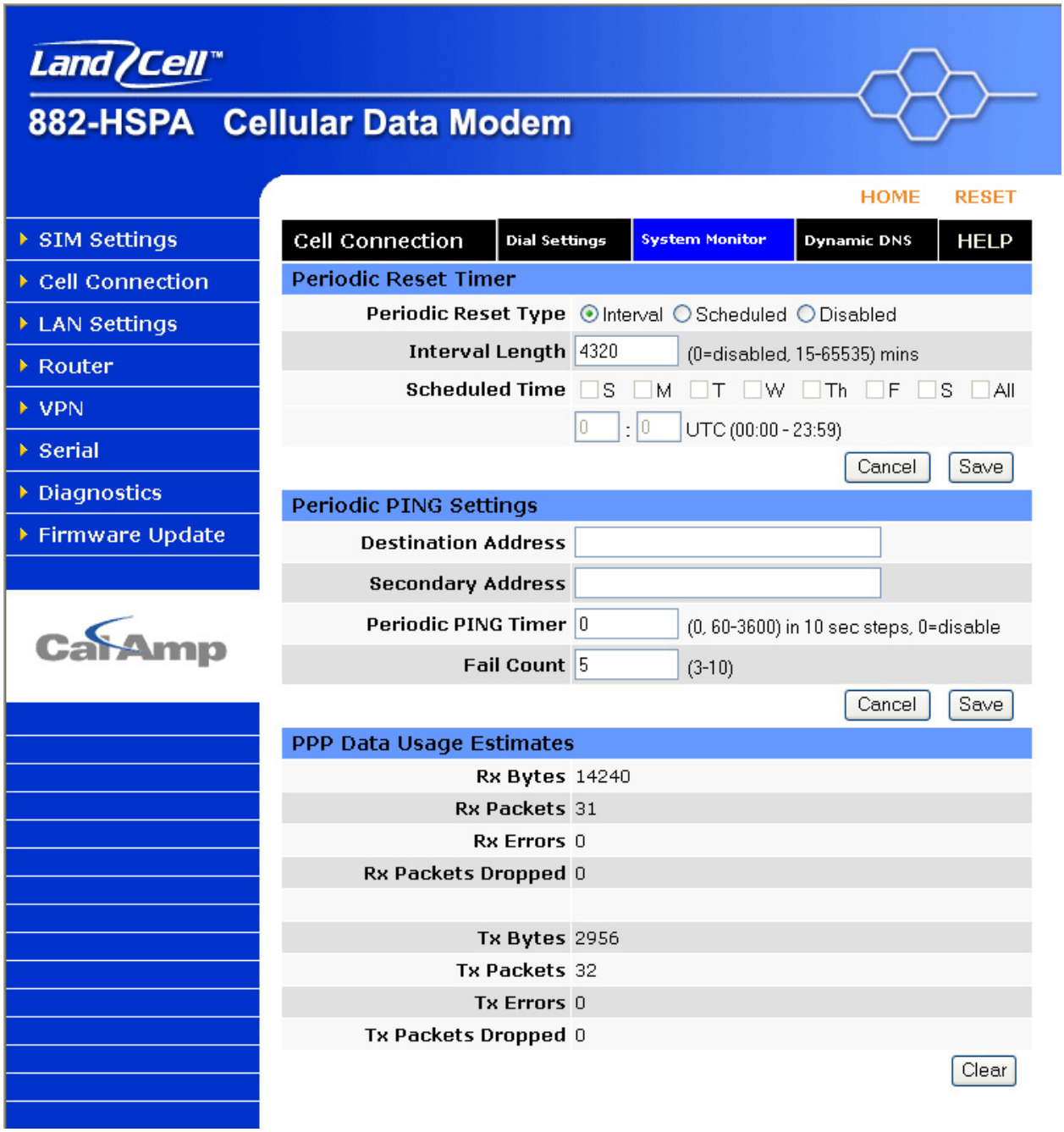


Figure 15.1: System Monitor page

Periodic Reset Timer

Periodic Reset Timeout:
Sets the Periodic Modem Reset timer to an Interval time, a Scheduled day, or disables it.

Interval Length:
Sets the Periodic Modem Reset time from 15 to 65,535 minutes. The Periodic Reset is disabled when set to 0. Default is set to 4320 min. (approximately 3 days)

Scheduled Time:
Sets the Periodic Modem Reset to occur at the specified time. Select the days of week desired or 'All' for everyday. Time is specified as Local Time, based on the location of the modem itself. The modem's current time is shown on the "home" page.

Periodic Ping Settings

Destination Address:
User may enter an accessible IP address or URL that will respond to a ping command.

Secondary Address:
User may enter an accessible IP address or URL that will respond to a ping command. This address will be used if the entered number of consecutive ping failures using the first address is reached.

Periodic Ping Timer:
User may enter an interval in increments of 10 seconds. The modem will ping the destination at that interval. Enter 0 to disable this feature.

Fail Count:
The modem will reset if the number of consecutive ping failures is equal to or greater than this entry and the secondary address is being used. Otherwise the modem will switch from the first address to the secondary address for the ping test.

PPP Data Usage Estimates

This section tracks the data received from and transmitted to the cellular network. This is a tool that may be used to estimate network usage. These totals are tracked by the router. Your carrier maintains separate statistics from which your billing is determined. One way to use this tool is to track usage over a fairly short period of typical usage. The total then can be extrapolated to estimate longer time periods. This router updates these statistics once approximately every 30 seconds. Press the **Clear** button to reset the totals to 0.

Rx Bytes:
The total number of bytes received by the modem from the cell network. All statistics will be cleared automatically if this count exceeds 1 billion (1,000,000,000).

Rx Packets:
The total number of TCP and UDP packets received by the modem from the cell network.

Rx Errors:
The number of corrupted TCP and UDP packets received by the modem from the cell network.

Rx Packets Dropped:
The number of TCP and UDP packets received by the modem from the cell network that were not accepted. This may occur due to memory or throughput problems.

Tx Bytes:
The total number of bytes transmitted by the modem to the cell network. All statistics will be cleared automatically if this count exceeds 1 billion (1,000,000,000).

Tx Packets:
The total number of TCP and UDP packets transmitted by the modem to the cell network.

Tx Errors:
The number of corrupted TCP and UDP packets received by the modem that were meant to be transmitted on the cell network.

Tx Packets Dropped:
The number of TCP and UDP packets received by the modem for transmit to the cell network that was not accepted. This may occur due to memory or throughput problems.

SECTION 16 – FIRMWARE UPDATE

Selecting **Firmware Update** from the left menu bar brings up the firmware update page. When newer versions of the modem firmware become available, the user can download the proper file from the CalAmp web site and manually update the unit by uploading the new firmware. Refer to 16.1 below.

The update file names are:

upgradegprs.tar.gz for the 822-GPRS modem.
upgradeedge.tar.gz for the 822-EDGE modem.
upgradehspa.tar.gz for the 882-HSPA modem.

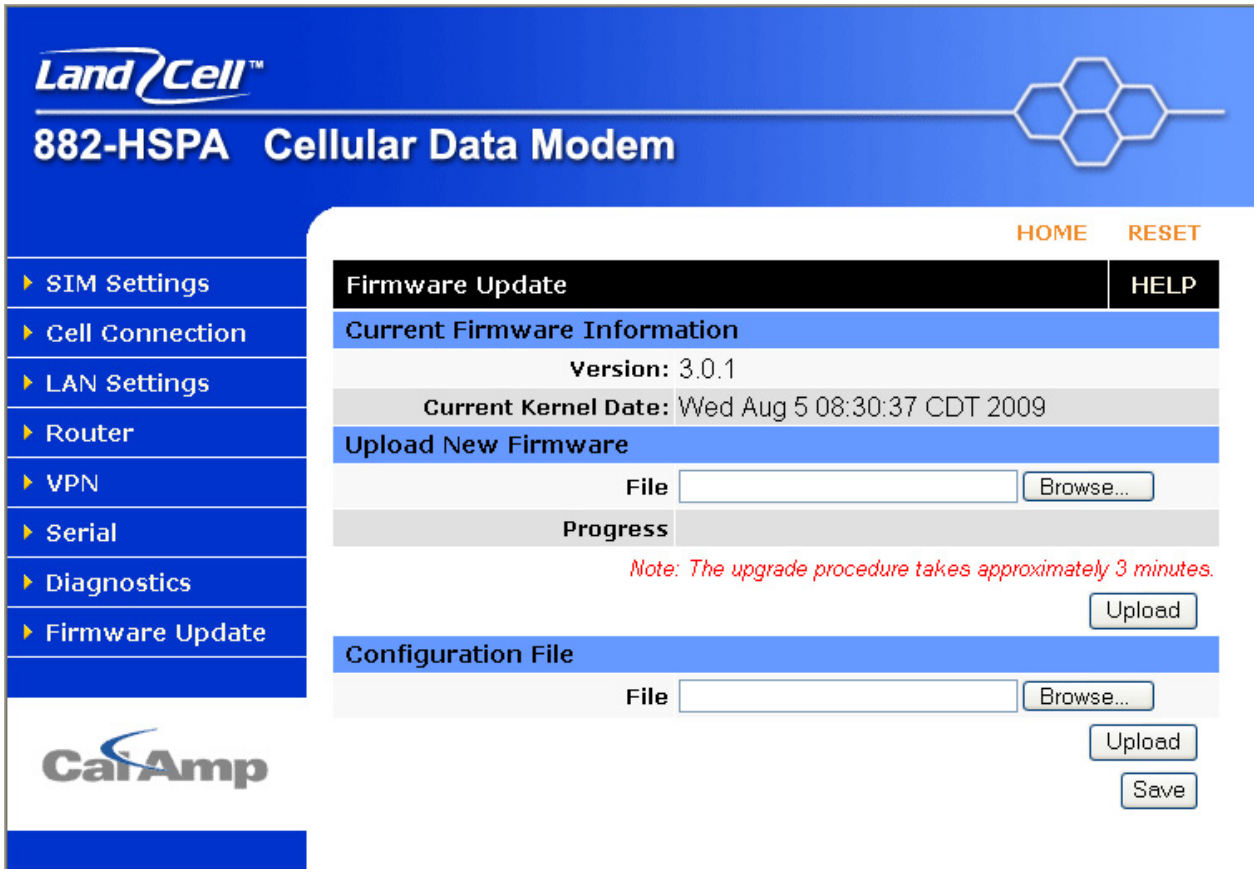


Figure 16.1: Firmware Update page

Current Firmware Information

Version:
Displays the modem firmware version currently loaded in the unit.

Kernel Date:
Displays the date of the operating system kernel the unit is running.

Upload New Firmware

File:
Field to input the downloaded update file to the modem. The **Browse** button can be used to locate the file in a specific folder. The update can be done remotely if Remote Administration is enabled.

Progress:
Displays the update progress after the **Save** button has been pressed.

Configuration File

File:
Field to input the uploaded configuration file to the modem. The **Browse** button can be used to locate the file in a specific folder. The file to be uploaded must be named **config.xml.** If multiple files need to be maintained, it is recommended that separate directories be used. The update can be done remotely if Remote Administration is enabled.

Select the **Upload** button to upload the new configuration file to the LandCell unit.

Save:
Returns a link to the configuration file on the unit. Right-click the link and select "Save Target As..." to save the file to the external location. The link page refreshes after 15 seconds. It is recommended to use the specified filename to save the file. If multiple files need to be maintained, it is recommended to use directory paths to separate the files.

SECTION 17 – LOGGING

Selecting **Diagnostics** from the left menu bar, then the Logging tab, brings up the logging page. The Logging page provides a way to capture the current status log of the modem. Such a log may be useful to CalAmp Technical Services personnel to help resolve operational problems. Refer to Figure 17.1 below.

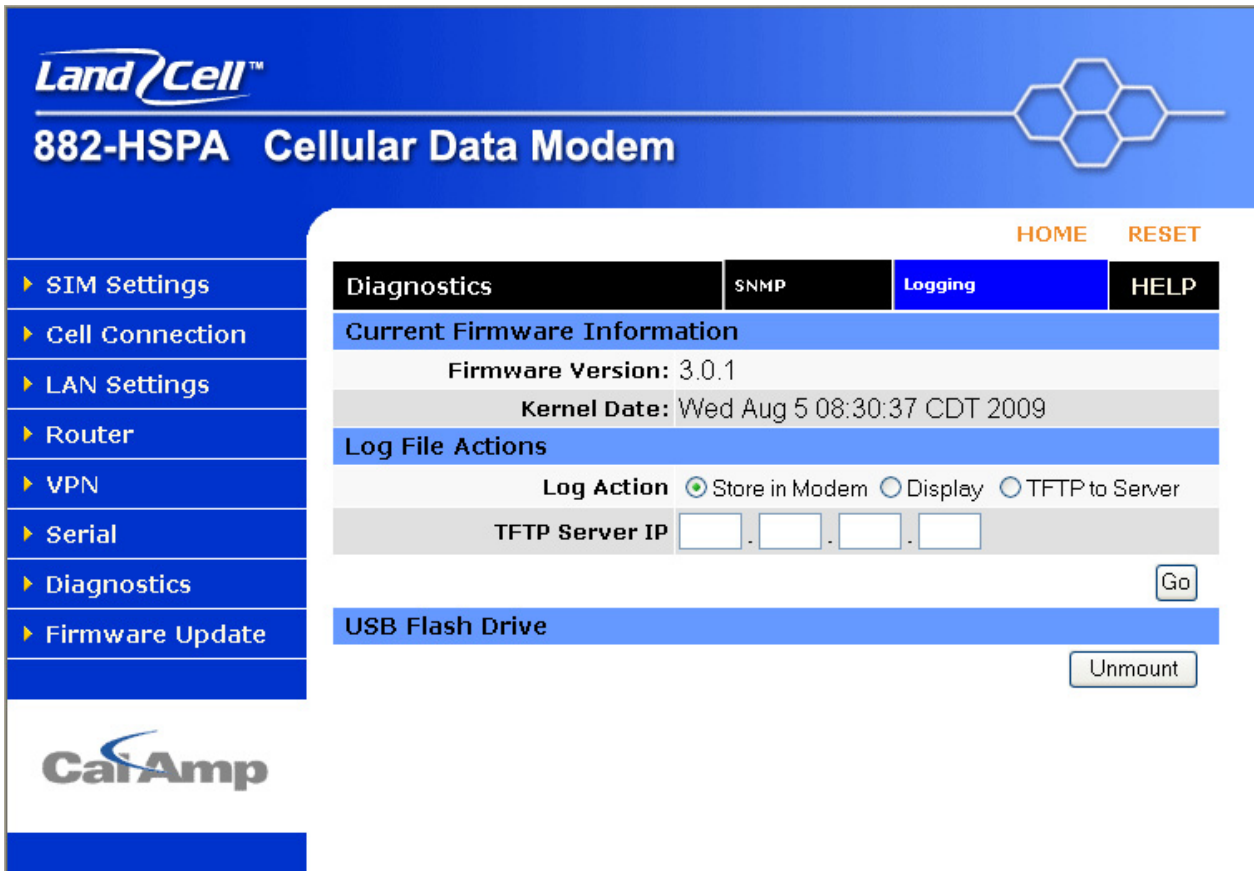


Figure 17.1: Logging page

Current Firmware Information

Version:
Displays the modem firmware version loaded in the unit.

Kernel Date:
Displays the date of the operating system kernel the unit is running.

Log File Actions

Store in Modem:
Selecting **Store in Modem** and pressing **Go** creates a current status log. Completing a **Store in Modem** will overwrite existing status logs.

Display:
Selecting **Display** and pressing **Go** will display a previously stored log directly to the web browser. You can use your mouse to select the text, copy it, and paste it into a text editor to save the log on your computer.

TFTP to Server:
Selecting **TFTP to Server** and pressing **Go** will initiate a transfer of a previously saved log file to a specified IP address using the TFTP protocol. In order for the transfer to be successful, a reachable IP address must be entered under **TFTP Server IP** and the computer at that IP address must be running a TFTP Server program. Many free TFTP Servers are available for download over the internet. Note that TFTP is different than FTP.

TFTP Server IP:
When selecting **TFTP to Server** and pressing **Go** a valid and reachable IP address must be entered here in order to complete the transfer of the saved log file using the TFTP protocol. In order for the transfer to be successful, a reachable IP address must be entered under **TFTP Server IP** and the computer at that IP address must be running a TFTP Server program. Many free TFTP Servers are available for download over the internet. Note that TFTP is different than FTP.

USB Flash Drive

Unmount:
Unmount a flash drive plugged into the USB port. This drive is mounted at /mnt/flash. For ODP use only.

SECTION 18 – SPECIFICATIONS

Product specifications are subject to change without notice.

General Specifications

Interface Connectors:	RS-232 DE-9S Connector (DCE) 10/100 Base-T Full Duplex USB Host Controller Power Connector I/O
Power Connector:	Molex Micro-Fit, 4 pin, PN:43045-0400
LED Indicators:	SVC-TYPE, TX/RX, DCD, RSSI
Antenna Interface:	SMA female
Size:	5.60 x 3.11 x 1.71 in.
Weight:	9.0 oz.
Power Input:	9.0 – 28VDC 1.8 W; 150 mA @ 12 VDC (average idle) 9.0 – 28VDC 4.7 W; 390 mA @ 12 VDC (peak active 882-GPRS) 9.0 – 28VDC 7.5 W; 625 mA @ 12 VDC (peak active 882-EDGE) 9.0 – 28VDC 7.0 W; 590 mA @ 12 VDC (peak active 882-HSPA)
Input Pin:	Drive with open collector or open drain, internal 18k ohm pull up to 3.3VDC.
Output Pin:	Open collector with series 0 ohm resistor as fuse.
Maximum TX Power:	GSM: +33 dBm min. / +30 dBm min (1900MHz)
Rx Sensitivity:	GSM: > -108 dBm typical, -102 dBm min.
Frequencies:	Cellular: TX: 824-849 MHz Rx: 869-894 MHz PCS: TX: 1850-1910 MHz Rx: 1930-1990 MHz
Temperature:	Operating: -30°C to +75°C (-22° to 167°F) 100% Duty Cycle Storage: -40°C to +85°C (-40° to 185°F) Note: RF performance of the cell module may be limited above 60°C.
Emissions:	FCC Part 15B
Transport Protocols:	UDP/TCP
Command Protocol:	Web interface, Command line v.250 AT, & proprietary
Certifications:	
882-GPRS	PTCRB Approved, Various Carrier Approvals FCC ID: QIP-TC65 Industry Canada ID: IC: 267W-TC65 CE Approved RoHS Compliant
882-EDGE	PTCRB Approved, Various Carrier Approvals FCC ID: QIP-MC75 Industry Canada ID: IC: 267W-MC75 CE Approved RoHS Compliant
882-HSPA	PTCRB Approved, Various Carrier Approvals FCC ID: N7N-MC8781 Industry Canada ID: 2417C-MC8781 CE Approved RoHS Compliant

NOTE: Power consumption while transmitting is dependent on the TX power level of the cellular module. The TX power level of the module is controlled by the cellular base station.

DECLARATION OF CONFORMITY FOR CE MARKING

Company contact details

Calamp Wireless Datacom, 299 Johnson Avenue, Suite 110,
Waseca, MN 56093-0833, USA

Phone: (507) 833-8819

Fax: (507) 833-6748

Calamp Wireless Datacom declares that their:

Cellular Data Modems

Model numbers:
819-GPRS-GEN, 822-GPRS-GEN, 822-EDGE-GEN, 882-HSDP-GEN.

are classified within the following EU Directives:

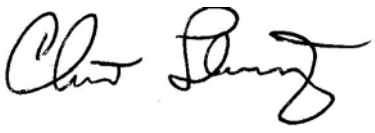
EU Directive 2006/95/EC Low Voltage
EU Directive 89/336/EEC & 2004/108/EC EMC
EU Directive 1999/5/EC R&TTE

and further conform with the following EU Harmonized Standards:

EN 60950-1:2006
EN 55024:1998+A2:2003
EN 55022:2006+A1:2007

Position of signatory: Director of Engineering

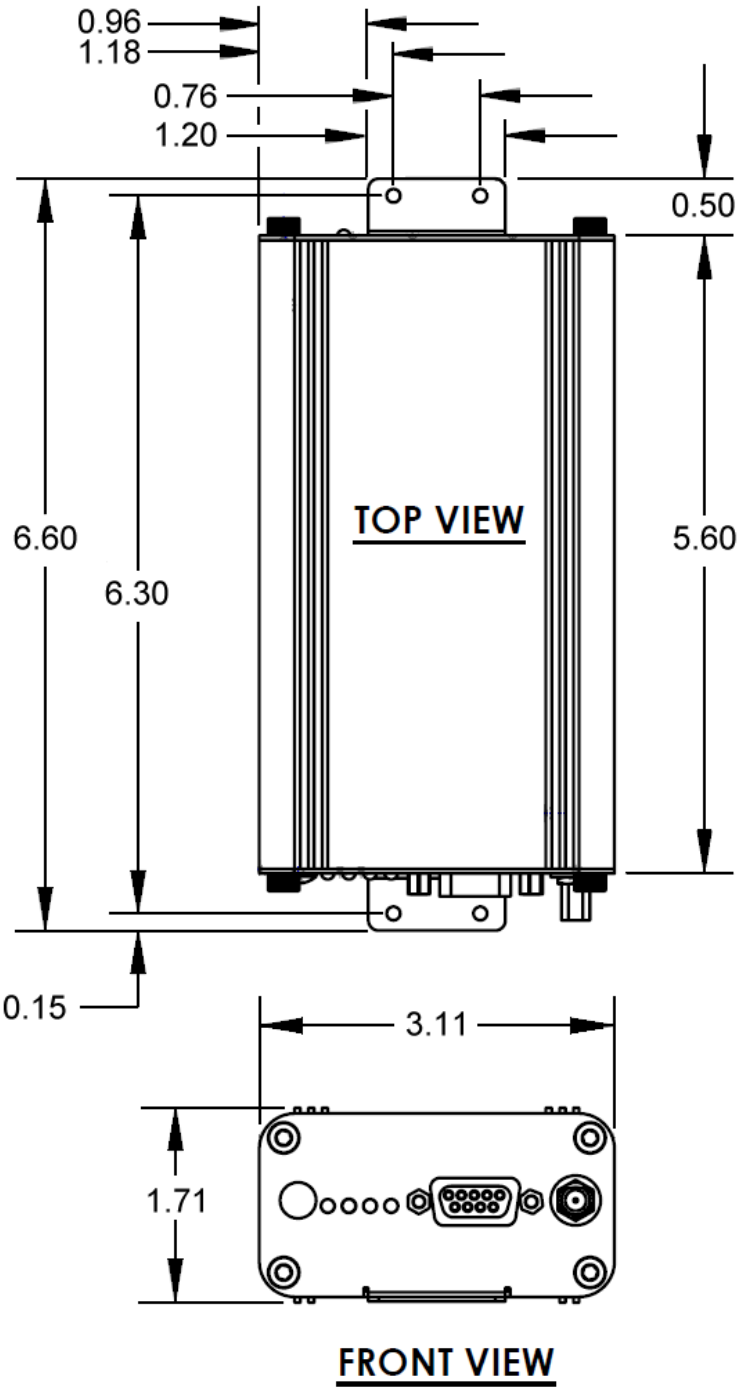
Name of Signatory: Chris Ludewig

Signed: 

Dated: 5/8/08

Mechanical Specifications

The following section describes in detail the exterior dimensions of the 882 GSM Series modems and how to utilize the mounting flanges to secure the modem to any surface, which can be drilled for such a purpose. The drawings may be used as layout reference, but it is advised that a physical comparison be made to the modem before proceeding with the mounting process.



All dimensions in inches.

SECTION 19 – ABBREVIATIONS

Abbreviation	Description
APN	Access Point Name
CSD	Circuit Switched Data
CTS	Clear to Send
DCD	Data Carrier Detect
DCE	Data Communication Equipment
DTE	Data Terminal Equipment
IMEI	International Mobile Equipment Identity
EDGE	Enhanced Data rates for Global Evolution
GPRS	General Packet Radio Service
GPS	Global Positioning System
GSM	Global System for Mobile communication
HSDPA	High-Speed Downlink Packet Access
LED	Light Emitting Diode
ME	Mobile Equipment
MS	Mobile Station
OTA	Over the Air
PDP	Packet Data Protocol
PPP	Point-to-Point Protocol
PPTP	Point-to-Point Tunneling Protocol
PRL	Preferred Roaming List
RSSI	Receive Signal Strength Indication
Rx	Receive
Tx	Transmit

SECTION 20 – SERVICE AND SUPPORT

Product Warranty, RMA and Contact Information

CalAmp guarantees that every 882 GSM Series Cellular Modem will be free from physical defects in material and workmanship for one (1) year from the date of purchase when used within the limits set forth in the Specifications section of this manual.

The manufacturer's warranty statement is available in Appendix 1. If the product proves defective during the warranty period, contact CalAmp Customer Service to obtain a Return Material Authorization (RMA).

RMA Request

Contact Customer Service:
CalAmp
299 Johnson Avenue, Suite 110
Waseca, MN 56093
Tel: 507-833-8819 ext. 6707
Fax: 507-833-6748

BE SURE TO HAVE THE EQUIPMENT MODEL AND SERIAL NUMBER, AND BILLING AND SHIPPING ADDRESSES ON HAND WHEN CALLING.

When returning a product, mark the RMA clearly on the outside of the package. Include a complete description of the problem and the name and telephone number of a contact person. RETURN REQUESTS WILL NOT BE PROCESSED WITHOUT THIS INFORMATION.

For units in warranty, customers are responsible for shipping charges to CalAmp. For units returned out of warranty, customers are responsible for all shipping charges. Return shipping instructions are the responsibility of the customer.

Product Documentation

CalAmp reserves the right to update its products, software, or documentation without obligation to notify any individual or entity. Product updates may result in differences between the information provided in this manual and the product shipped. For the most current product documentation, visit www.calamp.com for datasheets, programming software and user manuals.

Technical Support

M-F 7:30 AM to 4:30 PM CDT

CalAmp
299 Johnson Avenue, Suite 110
Waseca, MN 56093
Tel: 507-833-8819
E-mail: imcsupport@calamp.com

APPENDIX 1 – WARRANTY STATEMENT

CalAmp warrants to the original purchaser for use ("Buyer") that data telemetry products manufactured by DRL ("Products") are free from defects in material and workmanship and will conform to DRL's published technical specifications for a period of, except as noted below, one (1) year from the date of shipment to Buyer. DRL makes no warranty with respect to any equipment not manufactured by DRL, and any such equipment shall carry the original equipment manufacturer's warranty only. DRL further makes no warranty as to and specifically disclaims liability for, availability, range, coverage, grade of service or operation of the repeater system provided by the carrier or repeater operator. Any return shipping charges for third party equipment to their respective repair facilities are chargeable and will be passed on to the Buyer.

If any Product fails to meet the warranty set forth above during the applicable warranty period and is returned to a location designated by DRL, DRL at its option, shall either repair or replace such defective Product, directly or through an authorized service agent, within thirty (30) days of receipt of same. No Products may be returned without prior authorization from DRL. Any repaired or replaced Products shall be warranted for the remainder of the original warranty period. Buyer shall pay all shipping charges, handling charges, fees and duties for returning defective Products to DRL or DRL's authorized service agent. DRL will pay the return shipping charges if the Product is repaired or replaced under warranty, exclusive of fees and duties. Repair or replacement of defective Products as set forth in this paragraph fulfills any and all warranty obligations on the part of DRL.

This warranty is void and DRL shall not be obligated to replace or repair any Products if (i) the Product has been used in other than its normal and customary manner; (ii) the Product has been subject to misuse, accident, neglect or damage or has been used other than with DRL approved accessories and equipment; (iii) unauthorized alteration or repairs have been made or unapproved parts have been used in or with the Product; or (iv) Buyer failed to notify DRL or DRL's authorized service agent of the defect during the applicable warranty period. DRL is the final arbiter of such claims.

THE AFORESAID WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED AND IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. DRL AND BUYER AGREE THAT BUYER'S EXCLUSIVE REMEDY FOR ANY BREACH OF ANY OF SAID WARRANTIES IT AS SET FORTH ABOVE. BUYER AGREES THAT IN NO EVENT SHALL DRL BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL, SPECIAL, INDIRECT OR EXEMPLARY DAMAGES WHETHER ON THE BASIS OF NEGLIGENCE, STRICT LIABILITY OR OTHERWISE. The purpose of the exclusive remedies set forth above shall be to provide Buyer with repair or replacement of non-complying Products in the manner provided above. These exclusive remedies shall not be deemed to have failed of their essential purpose so long as DRL is willing and able to repair or replace non-complying Products in the manner set forth above.

This warranty applies to all Products sold worldwide. Some states do not allow limitations on implied warranties so the above limitations may not be applicable. You may also have other rights, which vary from state to state.

EXCEPTIONS

ONE YEAR:	Labor to replace defective parts in repeaters or base stations
THIRTY DAY:	Tuning and adjustment of telemetry radios
NO WARRANTY:	Fuses, lamps and other expendable parts

Effective 1/2008